COAL AGE

Vol. 2 NEW YORK, NOVEMBER 9, 1912 No. 19

ENTHUSIASM is the salt of life—the transmitting power that renews and enriches everything it touches. It casts all shadows behind, gives new heart and fresh hope to the discouraged, and increased power to those who are already strong. It is the genius of sincerity and drives away fear and limitation, and is that undefinable quality which forces conviction and makes mediocre ability more successful than great talent. Even truth accomplishes no victory without it.

Every great success in the history of coal mining is a triumph of enthusiasm, and no one can have this latter quality in full measure unless moving in his right place and being in love with his employment.

There is little hope of success for that coal-mine official who starts each day without enthusiasm. He may be ever so brilliant and clever, he may be popular and entertaining, but if he lacks this vitalizer of human energies, he will never be a leader of men and largely influence others.

There is no reason why patience should be in conflict with enthusiasm. They are copartners; neither will get very far without the other; together they are invincible. The combination is not so much a power which drives as a beckoning hand that leads.

You never find true enthusiasm in people who grovel on the lower plane of being; it is, therefore, hard to discourage a man possessed of this quality. No matter what objections may be raised, no matter how dark the outlook, he believes in his power to transform into a reality that vision which has appeared to him alone.

If all this is true, and enthusiasm is so essential to personal and corporate success, is it not well that every mine foreman, superintendent or manager should exercise great care not to smother the fire in an employee? Burning unquenched, it may generate the power to overcome serious obstacles.

Have you ever laughed disparagingly at one of your subordinates who has come to you brimful of ginger and obsessed with a desire to jump right in and put into execution some new plan or idea he has been sitting up nights to evolve and perfect.

Did you show your supreme omnipotence in a way that cooled his ardor, and then extinguish the last vestige of ambition in the man by indicating that any idea emanating from a brain other than your own could not be worthy of serious consideration?

No one is ever beaten until he is discouraged. Suppose the ideas suggested by an employee appear of doubtful value, there is still no earthly reason for providing a cold shower. You can defer action and cause further reflection without entirely suppressing zeal. Who would quench the fire in a locomotive just in order to stop or back up?

Think it over. Lack of aggressive originality on the part of men may be due to lack of encouragement on the part of a boss. It is as difficult to secure fervent loyalty from employees who have no audience higher up, as it is to spread quicksilver with your fingers.

Enthusiasm founded on sense works more powerfully on the persuasions and actions of men than either reason or revelation. The iron in a man's blood will be sufficiently tested by his competitors.

If you want cooperation, give it; if you would have the support of your subordinates, lend both your ear and your arm. Lastly, don't forget that "A drop of honey catches more flies than a hogshead of vinegar."

The So Called Coal Sales Contract

By Eli T. Conner

The present condition of the bituminous coal market seems an opportune time to say something about an evil which for years has been tolerated by the coal-producing interests; and that is the jughandled contracts under which fully 75 per cent. of the annual output of many mines is marketed.

It is undoubtedly good business policy, both for the producer and the consumer, to book contracts for nearly the estimated annual quantity of coal required, especially by a regularly operated manufacturing concern.

The operator in order to intelligently plan his year's business should have an assured outlet for 50 to 75 per cent. of the capacity of his mines at a definite price, or on a well-considered sliding-scale basis, reserving the balance of 25 to 50 per cent. for the spot market. In theory this system which is of long standing in the trade is excellent, but in the actual working out, it is anything but a "system."

Under such trade conditions as have existed in the soft-coal trade for several years past, it has worked to the serious disadvantage of the producing interests, the "contracts" amounting simply to options held by the consumer, upon which he can demand a definite amount of coal at a fixed price per ton, but under which he cannot be compelled to accept that amount of coal if he is not so inclined. In fact, as it works out, if the spot market price goes below the contract price, many consumers suspend their contract shippers and purchase spot coal at lower figures, and when the spot market rises above the contract stipulations, he demands his full "pound of flesh," thus working a hardship on the operator both going and coming. Of course, there are many honorable exceptions who regard scrupulously the letter and spirit of their contracts.

The present uplift in the market value of bituminous coal, and the opportunity it affords the producer to get more nearly on a basis of negotiating fair bargains, should be utilized as far as possible, to correct this long-standing abuse.

The temptation to take advantage of the present situation by "overlooking" contract orders and accidentally letting coal go on the spot market at the attractive figures obtainable, is undoubtedly great, and the operator cannot be seriously blamed for thus trying to make up some of his losses.

It must not be inferred from the foregoing that the purchaser of coal is wholly to blame for the conditions referred to, as that would be far from true. The keen competition of producing interests and the supposed excessive mine capacity above possible market requirements are largely responsible, and the operator is almost as much to blame as the consumer. This phase of a great industry is but a repetition of the experience of producers of anthracite coal for many years prior to the year 1900, when all sorts of expedients were resorted to in hopes of realizing a fair average price for the output, but with indifferent success, until the market demand had nearly reached the capacity of existing mines.

It is commonly believed, and is to some extent true, that the hard-coal industry was put on a stable business basis by the 'Coal Combination," namely the eight transportation companies serving the anthracite region, acquiring control of 80 per cent. of the mines, and by this means establishing the prices which have for ten years ruled in the market. While this is partly the reason, it could not have been accomplished were it not for the fact that the demand was so nearly up to the producing capacity of the mines, as it is well known that even 10 per cent. of a commodity thrown on the market at cut prices is apt to pull down the average to the low level.

We believe that the recent experience of the soft-coal producers, especially those whose product is marketed east of the Allegheny Mountains, is quite analogous to that of anthracite prior to the year 1900.

A potent influence bearing down the prices paid for bituminous coal is exercised by the largest consumers, the railroad companies, who can, and often do, bring such pressure on the operator as to compel him to accept prices much below a fair value for the fuel. There is no good reason why railroads should be more favored than other classes of consumers.

The short-sighted and unbusinesslike policy of some of the transportation companies has been shown recently. Last summer, when the spot market for soft coal was low, shipments from the mines were suspended where contract prices slightly exceeded spot prices and immediate fuel needs were in some cases supplied by spot purchases, and strange to relate, in other instances stock coal which had been laid down at low prices was picked up and used.

Now when soft coal commands $1.50 per ton at the mines, these consumers are insisting on their contractees protecting them at the old prices. To the credit of the operators, they are generally living up to their obligations, but *no more.*

We think the time is ripe for the formulation of a more equitable form of coal contract that will be equally binding on both parties thereto, and that the next coal year should be signalized by the producer insisting upon more equitable bargains than have heretofore ruled.

A German Electrical Installation

By J. B. Van Brussel*

A description of an unusually complete colliery electrical plant designed on broad lines and effecting a decided economy in operation. It is interesting to note that nearly all the important units are duplicated so as to provide for emergencies. Some interesting cost data is given.

*P. O. Box 151, Brussels, Belgium.

There are six electrical plants, having a total output of over 20,000 hp. in operation at the different pits of the well known Hibernia Collieries, at Herne, Westphalia, Germany. Of these, that known as the Shamrock Nos. 1 and 2 electric power station is by far the most important and modern.

Electricity is generated by three turbo-generators, of which two are driven by live and the third by exhaust steam. Their normal output is of 4300 kw.

The main particulars of the machines are as follows: One 1000-kw. live-steam Curtis turbine, with generator, running at 3000 r.p.m.; one 1800-kw. live-steam Parsons turbine, with generator, running at 1500 r.p.m. One of the live-steam turbo-generators usually stands as a reserve.

Condensing Plant

This plant consists of three separate but identically equal installations. The turbines exhaust into a main receiver, which is connected through valves to three condensers, of the surface-cooling type. Usually only two of the condensing plants work at one time, the third standing as a reserve. Each is capable of dealing with 44,292 lb. of steam per hour, with a vacuum of 90 per cent.

The circulating pump is directly connected to an electric motor of 89 hp.; this motor also drives the air and condensed-water pumps, to which it is belt connected. To provide against interruption through the stopping of either of the condensing plants, the pipes from the condensers to the circulating pumps, the air and the condensed-water suction pipes are in each case connected with each other, so that any of the condensing plants can be used for any one of the three turbines.

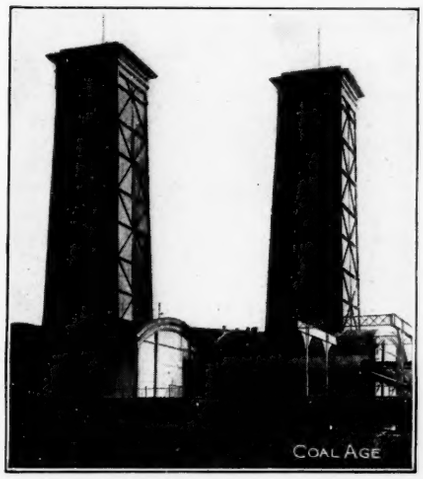
The two cooling towers are capable of dealing with 662,500 gal. of water per hour, and each of the circulating pumps has a capacity of 220,750 gal. per hour.

Exhaust-steam Plant

The total output of the two shafts is about 3248 tons per day of 16 hours. From No. 1 shaft 1083 tons per day are drawn from a depth of 1217 ft. by a high-pressure noncondensing engine, with cylinders 39⅜ in. in diameter and a stroke of 78¾ in. From No. 2 shaft about 2165 tons per day are drawn from a depth of 1870 ft. with a similar engine, the respective diameter and stroke being 43¼ and 74¾ in. Two small auxiliary engines are used between intermediate levels. These winders, with two ventilating fans and five compressing engines are connected up with the regenerative accumulators for supplying the low-pressure turbine.

The effective horsepower of the No. 1 hoist is 986; the No. 1 auxiliary, 197; the No. 2 hoist, 1183; the No. 2 auxiliary, 123; each compressor, 118; the main fan, 357; the reserve fan, 118; making a total of 3554 horsepower.

The hoists exhaust into a receiver (an old cylindrical boiler) which serves as a feed-water heater and to steady up the intermittent flow of steam, and deliver the same in a more constant flow to the regenerative accumulators. From this receiver is carried the main exhaust-steam line, which is joined by the exhausts from the fans and compressors before reaching the accumulators; all the exhaust-pipes are covered. Before entering the accumulators, the whole of the exhaust steam is passed through an oil extractor, the oil being afterward recovered.



Cooling Towers at Condensing Plant

There are two regenerative accumulators, each having a diameter of 13 ft. 1 in. and a height of 19 ft. 8 in., and consisting of a wrought-iron shell, the interior of which is so arranged that the exhaust steam entering nearly at the top of the vessel descends down one side to the bottom, and then ascends through the downcoming water. The latter is kept in circulation by means of two small centrifugal pumps. Delivering in at the top of the accumulators, the water falls down to the bottom, being baffled on its way; a self-regulating apparatus keeps the water at the bottom of the accumulators at a depth of about 18 inches.

From the accumulators the steam passes through water separators before entering the turbine. The latter develops 1500 kw., which is probably the largest load obtained by such a plant. The steam is supplied at a pressure varying from 14.7 to 17.6 lb. per sq.in. The turbine is coupled to a Brown-Boveri generator, giving three-phase alternating current at 5000 volts, and a frequency of 50, with coefficients equal to 0.8; it is provided with a 19-kw., 110-volt exciter, which is fitted on the main shaft. The steam consumption with a 90 per cent. vacuum and a load of 1100 kw. equals 37.4 lb. per unit.

Under ordinary working conditions, all the engines above mentioned are supplying steam, with the exception of the reserve fan. The turbo-generator is always running when the pit is working. During the night shift it runs on a very light load, there being only three to four compressors and the fan supplying exhaust steam. Should it be necessary to load the exhaust-steam turbo-generator to a greater extent than can be carried by the exhaust-steam available, live steam is admitted through a reducing valve, which permits it to mix with the exhaust steam before entering the turbine. An automatic live-steam inlet valve is in process of being fitted to the plant for the purpose of keeping the turbine loaded up to 1500 kilowatts.

When the turbine is developing 1500 kw., the horsepower represented by the engines supplying exhaust steam, amounts to 3436. It is somewhat remarkable that so large a power can be generated from what is otherwise a waste product.

The cost amounted to $85,000, including everything, the cost of the building and cooling towers being apportioned. This represents a plant cost of approximately $58 per kw. It is interesting to note that, were it necessary to produce the electricity by live steam, the cost for steam would be about $24,300. The units generated in 1908 amounted to 6,248,000 and live steam is charged to the rest of the plant at the rate of 0.4c. per unit.

Distribution

The generators run in parallel, are built for a voltage of 5000, three-phase current, 50 periods, and deliver on to the main switchboard. The power station at this colliery is one of five, which are all in connection, the others being situated at the different mines of the company, the total distance covered being about 24½ miles. Two cables are laid alongside each other

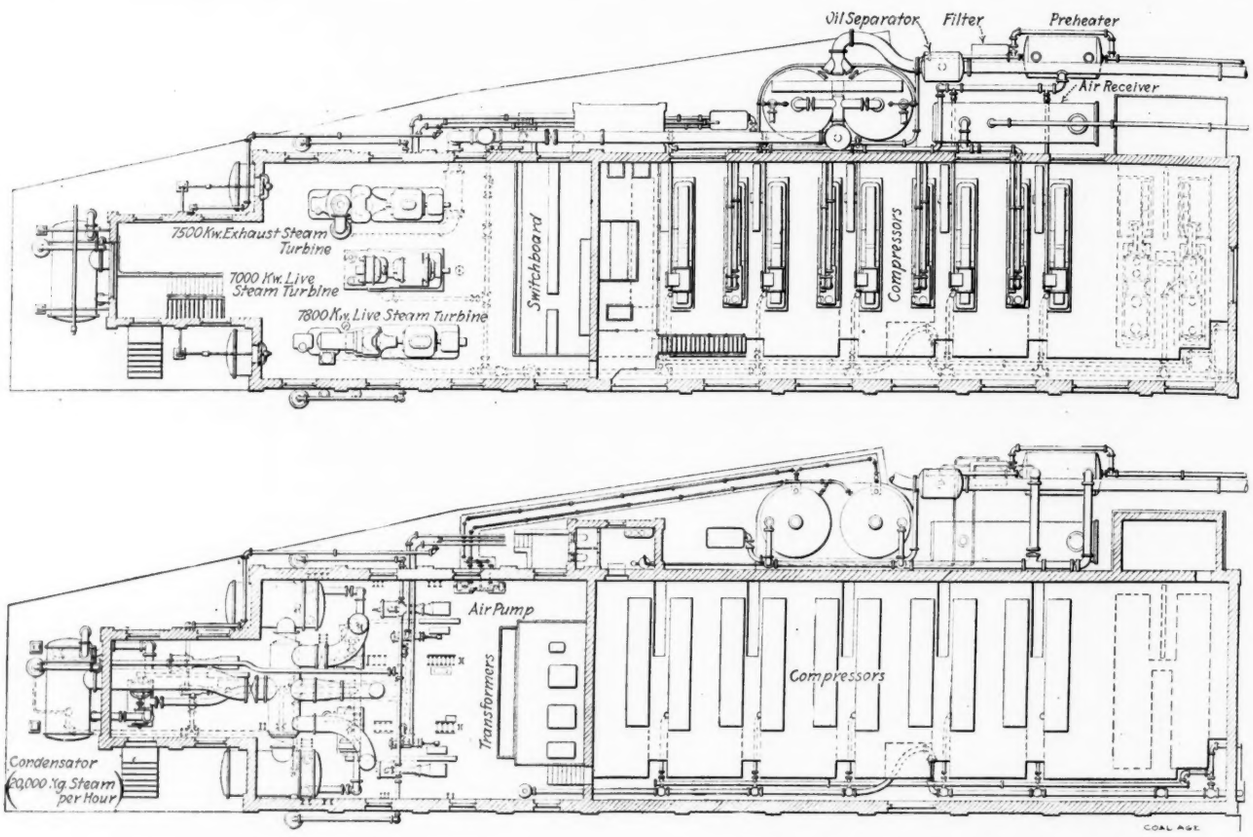
for the whole of the distance, representing 49 miles of cable. These are of the lead-covered, armored type, and laid in a brick trench 31½ in. below the surface of the ground. A special telephone cable is also laid alongside the main cables for connecting up the power stations.

The generators at all the collieries can be paralleled on to the main system, thus making it possible for current to be supplied from one to the other in case of a breakdown. Continuous supply is practically essential, as the power is not solely for colliery purposes, but the whole of the lighting and power supply for a large district depends upon this source. The voltage of transmission is 5000, step-down transformers being fixed at required points for light distribution, etc. Other collieries of the company, and also collieries belonging to other companies, are worked through distribution stations. Either of the cables is large enough to carry the ordinary load, the other usually standing as reserve. It may be interesting to add that the total units generated in 1908 amounted to something like 34,000,000, of which about 24,000,000 were used for colliery purposes.

For distribution in the colliery, alternating current is universally adopted, the transmission and driving, except in the case of the underground haulage, being all done by this current. Above ground, distribution current is 1000 volts, high-tension transformers being used for stepping down the voltage from 5000 volts.

The three-phase slip-ring motors for driving the washery, screens, workshops, etc., are all built for 1000 volts. For lighting purposes the 1000 volts is reduced to 110.

Transmission to the underground distribution station at the 1870-ft. level is through two 5000-volt, high-tension cables, one of which serves as a reserve. The main pumps are driven at 5000 volts, but for lesser voltage, static transformers are used to reduce to 1000 volts for power and 110 volts for lighting.



SECTIONAL PLANS OF POWER PLANT, SHOWING ARRANGEMENT OF TURBINES, COMPRESSORS AND PIPING

HAULAGE

Locomotive haulage on the overhead-trolley wire system is used. The voltage system adopted is 220 volts direct current, the rails serving as the return. For the conversion of the alternating current to direct, there are two motor-generators in a room situated near the downcast shaft and ventilated by the intake air. Although the intake air has not a clear passage through the room, owing to there being only one door, an air-tube extending to the innermost portion of the room serves for the outlet of the air; this is also further assisted by the injection of compressed air at intervals.

The motor-generators are connected up to the low-tension side of the 5000 to 1000-volt static transformers by means of a high-tension, lead covered, armored cable for 1000 volts, with oil switches and fuses on each phase, at both ends. Each motor-generator is capable, under ordinary working conditions, of supplying sufficient power for eight locomotives. Six locomotives are at present in constant use, two others standing by in reserve. Consequently, one of the motor-generators is also, as a rule, standing in reserve. Each has an output of 65 kw. at 230 volts, 730 r.p.m., and the outgoing trolley wires are charged at this voltage. The generators are compound wound, each being connected up to the direct-current switchboard, from which the feeding cables for the line run. Each locomotive has a normal tractive force of 970 lb. and a maximum of 1940 pounds.

The plant is designed for a capacity of 1920 cars of coal in an 8-hour shift. This is equivalent to an approximate output of 2116 tons per day, the average weight of coal per car being about 0.55 ton. The total length of the haulage road at present under electrification is about 4 miles, which is being gradually extended; the longest single run is about 1½ miles.

WORKING COST AND OUTPUT

The following are some actual working costs and outputs in connection with this plant. These costs are taken for the

month of March, and represent 26 working days of 16 hours each.

TABLE I—COSTS OF ELECTRIC LOCOMOTIVE HAULAGE AT THE 1870-FT. LEVEL, SHAMROCK NOS. 1 AND 2 COLLIERY

Interest on capital at 4 per cent	$121.66
Renewal of plant, life taken at 15 years; rate 4 per cent—4.993 per cent on capital	151.85
Oil and grease	9.04
Waste, etc	0.18
Repairs	206.71
Power; 15725 units at 0.72 c.	114.76
Wages	845.75
Subscriptions to workmen's funds etc.	78.70
Total cost of haulage	1528.65

TABLE II—TOTAL OUTPUT OF LOCOMOTIVES

	Cost per Ton-mile	Ton-mile Cents
Coal, stone etc.	55.008	2.76
Coal	45.000	3.38
	German tons	Cost per ton Cents
Total coal output	54,010.65	2.78
Total tons carried	68,308.25	2.20

ance in the motors and the bearings must be true and kept in good repair or the armature in revolving comes in contact with the magnets, with serious results. If the cost be modified in requirement with the above, charging 0.6c. per killowatt, then the cost per English ton of coal is only 2.47c., and per English ton-mile 2.92 cents.

Sprinkling

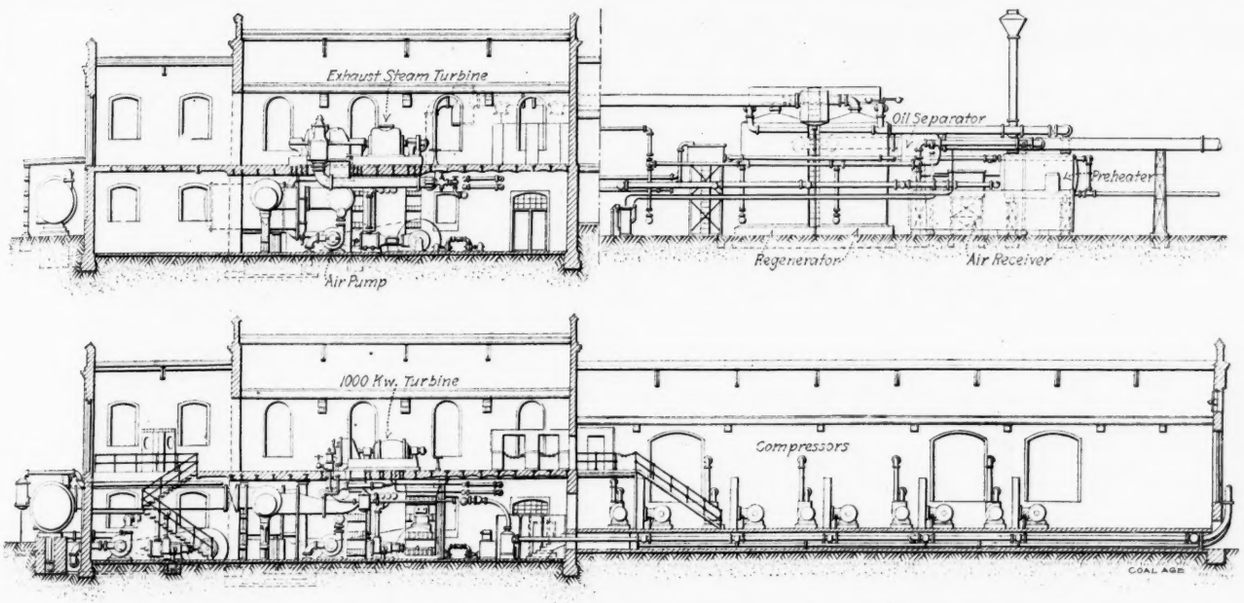
Considering the danger attending the adoption of electricity underground, it may be interesting to review the extensive watering arrangements adopted at this colliery. Of course it is not the intention to imply that watering is done so that this system can be adopted; on the contrary, the watering is certainly detrimental to the electric installation. At the same time, it serves to prevent the accumulation of dry coal dust on the haulage roads, thereby reducing the dangers connected therewith, and the existence of dry coal dust is rendered practically impossible by the frequent and copious use of water.

The output from the mine is about 3248 tons per day, and there exists almost exclusively for the purpose of keeping down the coal dust, 109,341 yd. of pipe line, 36,380 gal. of water being the average daily consumption; it is the exclusive duty of 34 men to water every part of the mine at least once a day. Every car of coal is watered before leaving the face, and at least once on its way to the shaft.

Pumping

The pumping arrangements are at present undergoing alterations, the old steam-driven plunger pumps being replaced by electrically-driven high-speed centrifugal pumps. The main pumping is at present done by two high-speed electrically-driven centrifugal pumps, one of the Sulzer and one of the Schwartzkopf type. In the method of mounting, both types are arranged identically, each consisting of two pumps in series, coupled to a motor between, which drives through elastic couplings. The three-phase slip-ring open-ventilated type motors are used in each case to take the full transmission-voltage, namely, 5000 at 50 periods per second; both pumps have the same capacity and raise 600 gal. of water per minute through a head of 1870 feet.

The motor for the Sulzer pump is of 690 hp. and runs at 1485 r.p.m., the respective figures for the Schwartzkopf pump being 690 hp. and 1480 r.p.m. Both pumps are situated near the shaft, directly above the water, and run alternately, one standing as a reserve.



ELEVATIONS THROUGH POWER PLANT, SHOWING GENERAL ARRANGEMENT OF TURBINES AND COMPRESSORS

It must here be mentioned that the "total tons carried" tabulated above, includes all brick, wood, etc., carried from the shaft to the inside places. The ton-mile output of each locomotive was, in March, 151.2 tons per shift, the working shift of locomotives being about 7½ hours. The average cost of the same, including interest on capital at 4 per cent., and depreciation on plant reckoned at (approximately) 5 per cent., amounted to 2.730 c. per ton-mile, which in this case corresponds to 2.78 c. per ton of coal. Allowing for the carriage of wood, stone, etc., the cost per ton of useful load dealt with by the electric haulage is reduced to 2.2c. per ton. These costs are low, and if the subscriptions to the workmen's funds be deducted, it would be further reduced.

Again the charge per kilowatt to the colliery plant is somewhat high and the amount under repairs is large, this being due to the renewal of armatures in the locomotive motors. There is only a very small clear-

On the 2196-ft. level, which is only now being developed, are two temporary electrically-driven centrifugal pumps for lifting the water from this level to the sump on the level above. Two 5000 volt cables convey the current from the distribution board at the fifth level to these pumps, although at present they only carry 1000 volts, the higher tension cable being for future developments. Each pump is directly connected, through an elastic coupling, to a three-phase asynchronous motor, and is erected on girders immediately above the sump.

The pumps are identical, one usually standing in reserve; each has a capacity of 210 gal., and lifts through a head of 328 ft. The motors are of 44 hp. taking current at 1000 volts and run at a speed of 1440 r.p.m.

In conclusion, thanks are due to Director G. A. Meyer for the privileges granted for the collection and publication of these particulars.

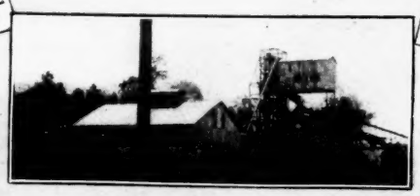
Snap Shots in Coal Mining

We Will Pay $5 for the Best Photograph Published Here Each Week.

WASHERY AND CULM CONVEYOR AT CONSOL COLLIERY, HILLSIDE COAL AND IRON CO. AT AVOCA, PENN

A WYOMING GEOLOGICAL PARTY. LEFT TO RIGHT, R. FORRESTER (DECEASED) GEOLOGIST D. & R. G. CO. F. W. C. WHITE, GEN'L MG'R. A. C. M. CO. COAL DEPT. R. SALES, CHIEF GEOLOGIST A. C. M. CO. DR. TALMAGE, UTAH UNIVERSITY. T. SNEDDON, SUPT. D. C. & C. CO. AND HOPKINS.

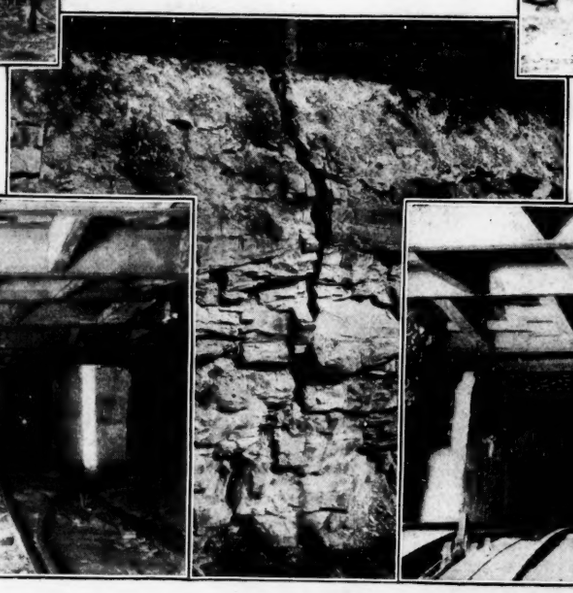
SLIDE AT FRANK ALBERTA, CANADA PROBABLY CAUSED BY COAL MINING, WHICH KILLED 70 PERSONS AP. 29/1903

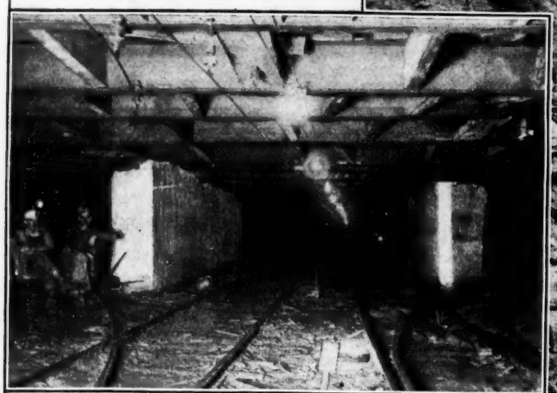


SILVER CREEK MINES, FARMINGTON, ILL

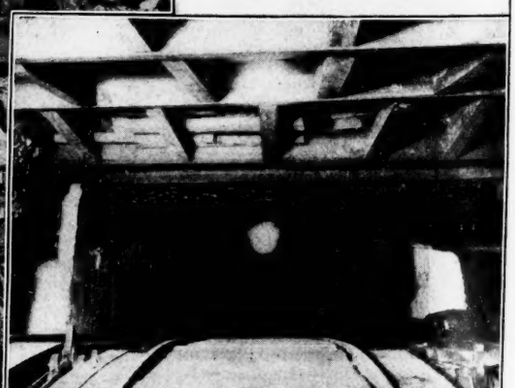
POWER PLANT OF CLINCHFIELD COAL CORPORATION AT DANTE, VA.

6 STEAM-TURBINE PLANT OF U. S. COAL & OIL CO. HOLDEN W. VA. COOLING CONDENSER WATER BY SPRAYING.





MAIN ENTRANCE FROM SHAFT WHERE RUNABOUTS INTERSECT, BUCKNER, ILL.



SURFACE BREAK IN GEORGES CREEK FIELD, MARYLAND.

TOP OF TRACK INCLINE AT NO 2 MINE BUCKNER, ILL.

COAL AGE

Bituminous Coal Mine Reports

Special Correspondence

Lack of uniformity in the daily and weekly reports of mine foremen and firebosses, in the bituminous mines of Pennsylvania, makes it difficult for the mine inspectors to compile the information required under the new law. Blank forms of reports adopted and recommended by inspectors are sent to all mine foremen and firebosses with good results.

For some time past, the mine inspectors in Pennsylvania have been giving careful attention to the matter of obtaining more uniformity in the daily and weekly reports of mine foremen and firebosses. Much trouble has been experienced, in the past, in compiling the information that should be obtained from these reports, owing to the indifferent manner in which many mine officials regarded them. The difficulty arising from lack of uniformity in the reports received from different mines is naturally much increased when mine foremen are transferred from one district or mine to another.

The new law that went into effect in the bituminous district, in Pennsylvania, June 9, 1911, specified certain requirements that were only met in a comparatively few reports. The trouble experienced was, perhaps, greater in the Pittsburgh district than in other parts of the state. A few foremen and firebosses who had acquainted themselves with the new law made intelligent reports that covered fairly the requirements of the new law. A large number of reports, however, received from foremen and firebosses who had given little attention to the new law were insufficient to meet its requirements.

At a meeting of the mine inspectors in the bituminous region, this question was carefuly considered with the result that blank forms of reports were drawn up and adopted, covering the several requirements of the mine law. The mine inspectors recommended that these several forms of reports be used by the mine foremen in making up their weekly and monthly reports and by the firebosses for their daily reports. Samples of the style of the blank forms furnished by the inspectors are given below, and these are now being used quite generally in the Pittsburgh district.

The question is often asked, "How can a fireboss ascertain whether or not the usual volume of air is passing?" The inspectors have decided that all that is expected or required of the fireboss in complying with the law, is to use his best judgment in regard to the volume of air passing in the main intake, estimating this from the velocity of the air current. A good fireboss will be able to detect, at once, any appreciable reduction in the velocity of the air passing in the airways. He is required, further, to say whether or not the air is traveling in its proper course. This portion of the fireboss report is considered of great importance by the inspectors.

Cases are known where the fireboss was asked, "How did you find the air

BLANK FORM OF MINE FOREMAN'S MONTHLY REPORT

MINE FOREMAN'S REPORT of.....Mine, District No....., of the Bituminous Coal Region of Pennsylvania, as required by Act of Assembly, approved June 9, 1911, for month of.....,191.....

Date	State from your personal observation during the day, the condition of the mine as to health and safety. Have the dangers reported to you been removed?	State whether or not there was a proper supply of materials on hand for the safe working of the mine.	Signature of Mine Foreman for each day and of Superintendent for each week.

BLANK FORM OF MINE FOREMAN'S WEEKLY REPORT

MINE FOREMAN'S REPORT of Weekly Air Measurements in.....Mine, District No..... of the Bituminous Coal Region of Pennsylvania, as required by Act of Assembly, approved June 9, 1911, for the month of.....191.....

Date	Name or number of entry or name or number of split	Area of entry in feet	Velocity of air feet per minute	Cubic feet of air passing per minute	Number employ'd in split	Area of cut through in room in feet	Cubic feet of air required per minute	Number of revolutions of fan	Water gage in inches	Number of cubic feet of air per minute entering at inlet	Number of cubic feet of air at outlet

BLANK FORM OF FIREBOSS' DAILY REPORT

FIRE BOSS' DAILY REPORT of.....Mine, in District No..... of the Bituminous Coal Regions of Pennsylvania, as required by Act of Assembly, approved May 15th, 1893.

Date 191	Explosive Gas			Danger from Slate, Roof and Sides			Other and Exceptionally Dangerous Conditions and General Remarks	No. of District or Section	Signature of Fire Boss. Countersignature of Mine Foreman
	Found in Rooms No	Location of Rooms in Entries No.	Found in Entries No.	In Rooms No.	Location of Rooms in Entries No.	Danger in Entries No			

that morning?" The answer given in reply was, "The air was good and traveling in its proper course." But later investigation showed that the shaft was frozen tight, being completely closed with ice, which fact was, of course, unknown to the fireboss. Such testimony, on the part of a fireboss, shows plainly that he paid no attention to the air current; but when asked, assumed that the usual current of air was passing.

These blank reports have now been used in the western end of the state, in what is known at the Pittsburgh district, for about six months; and the result shows that closer examinations of the mines are being made by all firebosses in this district.

Following are copies of the letters that were sent out with the blank forms of report the inspectors recommended to be used:

Letter to Mine Foremen

Commonwealth of Pennsylvania, Bituminous Inspection District

Dear Sir:—

Owing to there being a lack of uniformity in reports made by mine foremen on the record books, and owing to there being a general failure on the part of mine foremen to give such information in their daily reports, as is called for and required by the Act of June 9, 1911, we call your attention to the provisions of Sections 3 and 18 of Article 4 of the aforesaid Act.

The mine foreman shall each day enter plainly, and sign with ink, a report in a book provided for that purpose. The report shall state clearly any danger that may have come under his personal observation during the day and any danger reported to him by his assistant or the fire bosses. You will note, in this connection, that you will be required to report the dangers entered in the record book by the fire boss or fire bosses and assistant mine foremen or reported to you verbally by these officers, as well as the dangers observed or discovered in your own personal examination and inspection of the mine.

Said report shall also state whether or not there is a proper supply of material on hand for the safe working of the mine. Expanding this sentence, it would read: Said report shall also state whether there is a proper supply of material on hand for the safe working of the mine, or whether there is not a proper supply of material on hand for the safe working of the mine. You will, therefore, note that it is imperative for you to make a statement in either case as to whether the material is on hand or as to whether it is not on hand for the safe working of the mine.

Further, you are required to state whether or not the requirements of the law are complied with. You will also note from the language in this sentence, as above, that a statement must be made either way as to the law; that is, you must state whether the requirements of the law are complied with or whether they are not complied with, stating when the law is not complied with, in what particulars it is not carried out.

Once each week, you are required to measure the air at the inlets and outlets, while the mine is in operation, and also in the last crosscut in the last room turned and in the entry beyond the last room turned in each entry, stating at each point so measured, the area, velocity, and quantity, giving also the number of persons employed in each split. In making the record of air measurements in the record book, we would recommend that the workings of each split are set directly under the number of the split, so that there will be no misunderstanding as to what workings are included within the confines of any particular split. We would also recommend that the number of each room in which air is measured is given with the number of the entry.

A Summary of the Above is as Follows: 1. Report daily and sign with ink; 2. State clearly dangers observed personally during the day and dangers reported by assistant mine foreman and fire boss; 3. State whether there is, or is not, a proper supply of material on hand for the safe working of the mine; 4. State whether the requirements of the law are complied with, or whether the requirements of the law are not complied with, a statement in either case being necessary; 5. Once each week, measure the air at the inlets and outlets, while the mine is in operation, and also in the last crosscut in the last room turned and in the entry beyond the last room turned in each entry, stating at each point so measured the area, velocity, and quantity, and the number of persons employed in each split.

We shall expect and will insist on each item of information required by the recited Act and Sections being embodied in the report of the mine foreman in a clear and concise manner, but omitting nothing essential to the clearness of the report. You will understand, however, that you are not in any way relieved from giving the information required by the headline inserted by the Department of Mines in the present record book, notwithstanding anything to the contrary herein contained.

Yours very truly,
Inspector of Mines

Letter to Firebosses

Commonwealth of Pennsylvania, Bituminous Inspection District

Dear Sir:

Owing to there being a lack of uniformity in the reports made by fire bosses, and owing to there being a lack of clearness in many of the reports, we recommend the four forms below to be adopted by firebosses in making their report on the record book. The first form to be used when the district is found free from danger, on the first round; the second form to be used when dangers are found on the first round; the third form to be used when no danger is found on the second round; and the fourth form to be used when danger is found on the second round. You will omit in the report all that is inclosed within parenthesis, this being inserted merely as a matter of instruction.

Yours very truly,
.....
Inspector of Mines.

Form of Entry to Be Made in Record Book by Fireboss After Each Examination

FIRST EXAMINATION....A. M. or P. M. to....A. M. or P. M.

Have examined District No. 2 (the confines of the district being accurately and plainly described in the fire boss record book by the mine foreman) according to law and found same free from dangers of all kinds and explosive gas, and the air current traveling in its proper course and in the usual volume.

FIRST EXAMINATION FROM....A. M. or P. M. to....A. M. or P. M.

Have examined District No. 2 (the confines of the district being accurately and plainly described in the fire boss record book by the mine foreman) according to law, and found same free from danger of all kinds and explosive gas, except places reported (under the columns headed explosive gas and dangers from slate, roof, and sides as the case may be), which are fenced off (describing accurately, plainly and clearly in said columns the location and nature of dangers fenced off) and the air current traveling in its proper course and in the usual volume.

SECOND EXAMINATION

Have examined all working places in District No. 2 (the confines of the district being accurately and plainly described in the fire boss record book by the mine foreman) according to law, and found same free from dangers of all kinds and explosive gas, and the air current traveling in its proper course and in the usual volume.

SECOND EXAMINATION

Have examined all working places in District No. 2 (the confines of the district being accurately and plainly described in the fire boss record book by the mine foreman) according to law, and found same free from dangers of all kinds and explosive gas, except places reported (under the columns headed explosive gas, and dangers from slate, roof, and sides as the case may be) which are fenced off (describing accurately, plainly and clearly, in said columns the location and nature of dangers fenced off) and the air current traveling in its proper course and in the usual volume.

The above letters were sent to all mine foremen and firebosses. The plan of the inspectors, on being submitted to the chief of the Department of Mines, received his approval. The results obtained in the short time in which the reports have been used, show what good can be attained by the careful consideration of conditions in the mines, by the entire body of inspectors, acting together to give to the industry they represent, the benefit of their combined experience.

The matter of securing as great uniformity as possible, in the reports required by the law to be made monthly, weekly and daily, by mine foremen and firebosses, is of the utmost importance both to the operator and the inspector. Full reports necessitate greater care in the examination of the mine, and the prompt removal of existing dangers to avoid their appearing repeatedly on the reports. Greater safety is insured the mine worker and the general efficiency of the operation is increased, and more reliable reports secured.

Investigation has shown the consumption of coal per head of population in the following countries to be:

	Tons
United Kingdom	3.96
United States	4.14
Belgium	3.11
Germany	2.05
France	1.35
Austria-Hungary	0.51
Russia	0.15

Conversion and Use of Electricity

Special Correspondence

At the Penn-Mary mines, the steepness of the grades makes it necessary to use many hoists; these are nearly all electric. Small hoists are used for local dips. An electric larry with a reel mounted below the frame carries the rock to the end of a long dump, well beyond the trolley lines. Electrical fans and pumps are installed.

The article published in the issue of Nov. 2 on the Penn-Mary mines discussed the main details of the power generation. It is purposed to show in this article how the alternating current is converted to direct and how the electricity is used for haulage and pumping.

Fig. 1 shows the relation and method of transmission between the points where the power is generated, converted and used.

The Substations

Only two substations are now in operation (see Fig. 1). Others may be installed as the development of the property progresses. The buildings and, insofar as is possible, the equipments are duplicates, insuring uniformity of apparatus and of operation. The substation buildings, see Fig. 2, are neatly and substantially constructed of yellow, hard-burned brick, the roofs being covered with asbestos shingles. Fig. 3 indicates the arrangement of apparatus within the buildings.

Both of the Westinghouse motor-generators operate at 900 r.p.m. Each consists of a 300-kw. commutating-pole, 250-volt, direct-current generator driven by a 450-hp., 2200-volt, three-phase, 60-cycle, synchronous motor. The switchboard for controlling the set in sub-station No. 1 is shown in Fig. 4, and its wiring diagram in Fig. 7.

The switchboard of substation No. 1 is arranged for starting the motor-generator from the direct-current side, while in substation No. 2 (not shown) the motor-generator is started from the alternating-current side; otherwise the two boards are similar.

The direct-current feeder panel in substation No. 1 (Figs. 4 and 7) is arranged with double-throw switches, so that the out-going direct-current feeders can be served by either the substation generator or by the direct-current generators in the power house. The substation is connected with the power house by a 500,000 cir. mil., direct-current tie line.

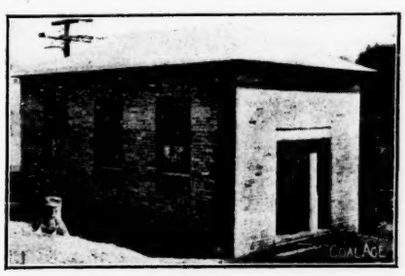


FIG. 2. ONE OF THE PENN-MARY SUBSTATIONS

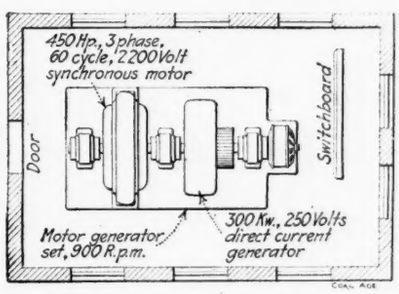

450 Hp., 3 phase, 60 cycle, 2200 Volt synchronous motor
Door
Switchboard
Motor generator set, 900 R.p.m.
300 Kw., 250 Volts direct current generator
COAL AGE

FIG. 3. DIAGRAM OF INTERIOR OF A SUBSTATION

When the motor-generator No. 1 was first installed, it was operated in the day time only; but it was found that a saving of coal costing $5 per 24 hr. resulted when the motor-generator was operated at night also. This saving accrued through the high efficiency of the high-voltage alternating-current feeder and from the fact that the alternating-current energy is developed by the low-pressure turbine with low-pressure steam. When the motor-generator was not operated, it was necessary to transmit direct-current energy developed by the noncondensing engines over the tie line to the feeder panel in the substation switchboard.

Electric Haulage

The electric haulage at Penn Mary can be considered under three heads: 1. Haulage with small portable hoists; 2.

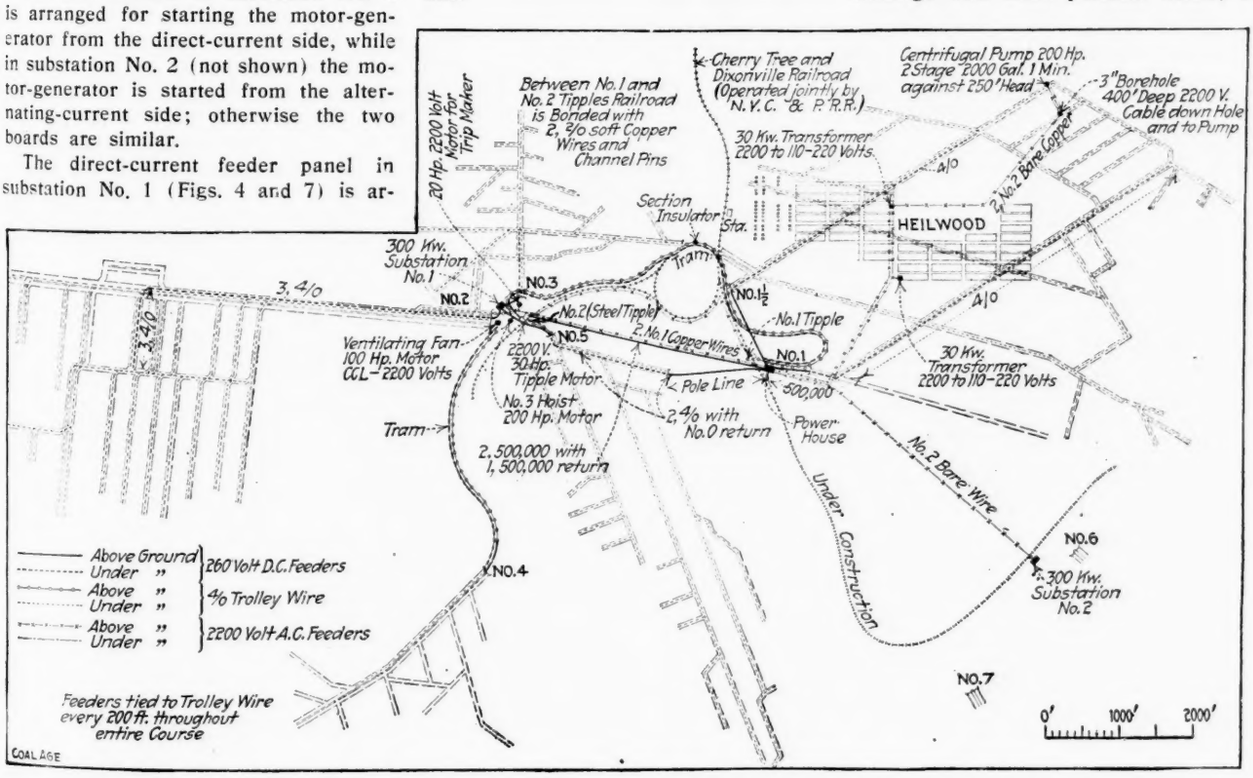

Between No. 1 and No. 2 Tipples Railroad is Bonded with 2, 4/0 soft Copper Wires and Channel Pins
Cherry Tree and Dixonville Railroad (Operated jointly by N.Y.C. & P.R.R.)
Centrifugal Pump 200 Hp. 2 Stage 2000 Gal. 1 Min. against 250' Head
3" Borehole 400' Deep 2200 V. Cable down Hole and to Pump
20 Hp. 2200 Volt Motor for Trip Maker
30 Kw. Transformer 2200 to 110-220 Volts
4/0
2 No. 2 Bare Copper
Section Insulator Sta.
HEILWOOD
300 Kw. Substation No. 1
Tram
NO.3
NO.2
NO.1½
No. 2 (Steel Tipple)
No. 1 Tipple
2 No. 1 Copper Wires
NO.5
NO.1
3, 4/0
Ventilating Fan 100 Hp. Motor CCL-2200 Volts
2200 V. 30 Hp. Tipple Motor
No. 3 Hoist 200 Hp. Motor
Pole Line
500,000
2, 4/0 with No. 0 return
Power House
30 Kw. Transformer 2200 to 110-220 Volts
Tram
2, 500,000 with 1, 500,000 return
No. 2 Bare Wire
Under Construction
NO.6
300 Kw. Substation No. 2
NO.4
NO.7
Above Ground
Under "
Above "
Under "
Above "
Under "
260 Volt D.C. Feeders
4/0 Trolley Wire
2200 Volt A.C. Feeders
Feeders tied to Trolley Wire every 200 ft. throughout entire Course
0'
1000'
2000'
COAL AGE

FIG. 1. A WIRING PLAN OF THE PENN-MARY MINES, SHOWING POWER HOUSE AND SUBSTATIONS

Haulage with locomotives; 3. Main entry haulage, involving a combination of locomotives and a powerful, high-speed hoist.

For development work there are in service seven Lidgerwood portable motor-driven hoists similar to that in Fig. 9. Each is self-contained with a Westinghouse 220-volt motor, a Westinghouse reversible-drum controller and resistors. There are four 11-hp., two 3-hp. and one 15-hp. hoists. These outfits are used in driving headings and in other pioneer work in advance of permanent track and trolley construction. They haul cars up grades which are so steep that the cars cannot be pushed by men. The average grade encountered in this work is about 5 and the maximum grade is 15 per cent.

There are 14 Baldwin-Westinghouse mine locomotives in service at the Pennmary workings. In No. 1 and No. 5 mines, 15-ton locomotives are used, and 12-ton locomotives serve for haulage in the others. The mine cars have a nominal capacity of 2240 lb. They weigh when empty 1550 to 1560 lb., and when loaded 3790 to 3800 lb. The cars are low; as the coal is but 3 to 4 ft. thick. The following table gives some details relative to mine haulage.

Fig. 6 shows a Baldwin-Westinghouse, 15-ton electric locomotive equipped with two No. 102 Westinghouse motors, hauling a 60-car trip out of No. 1 mine.

FIG. 6. A 15-TON BALDWIN-WESTINGHOUSE MOTOR WITH A STRING OF 60 LOADS

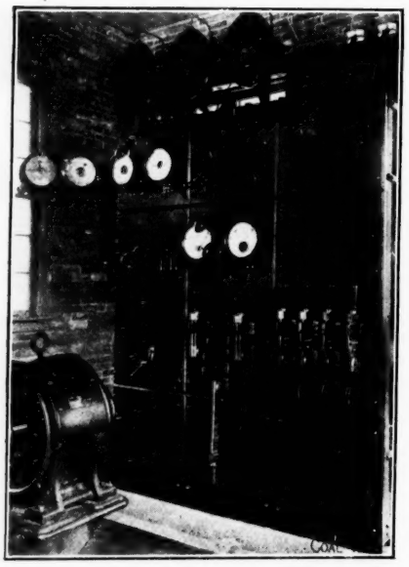


FIG. 4. A SUBSTATION SWITCHBOARD

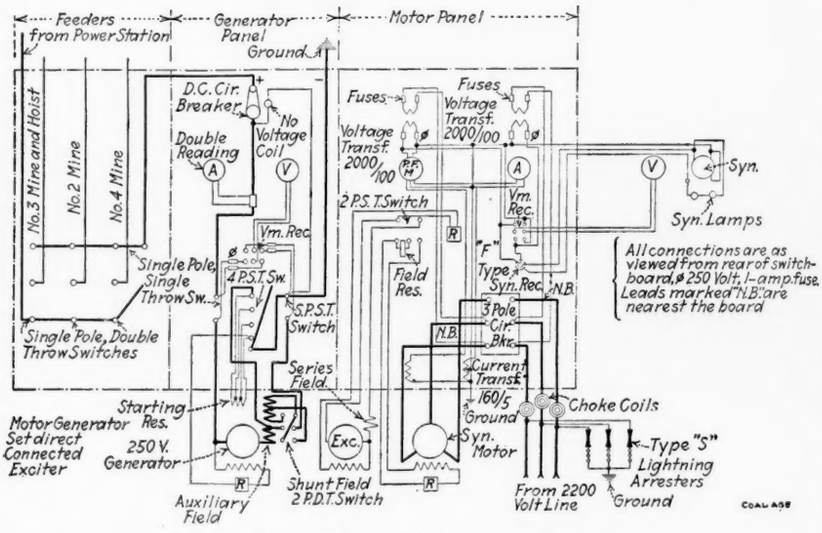


FIG. 7. WIRING PLAN OF SUBSTATION SWITCHBOARD

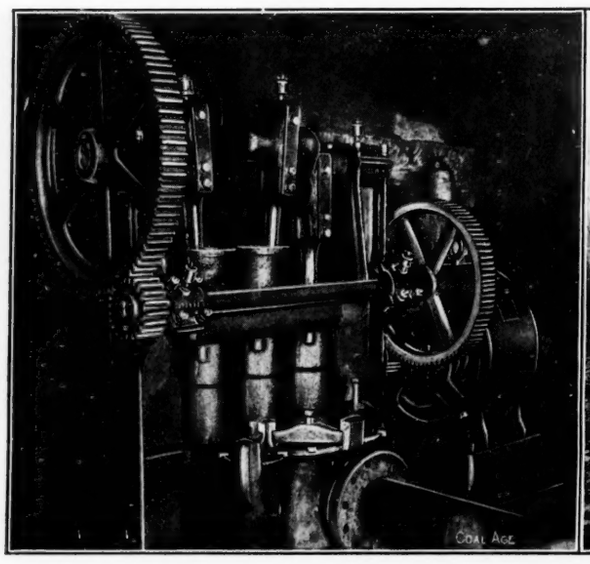


FIG. 5. A GOULD TRIPLEX PUMP ACTUATED BY WESTINGHOUSE DIRECT-CURRENT MOTOR

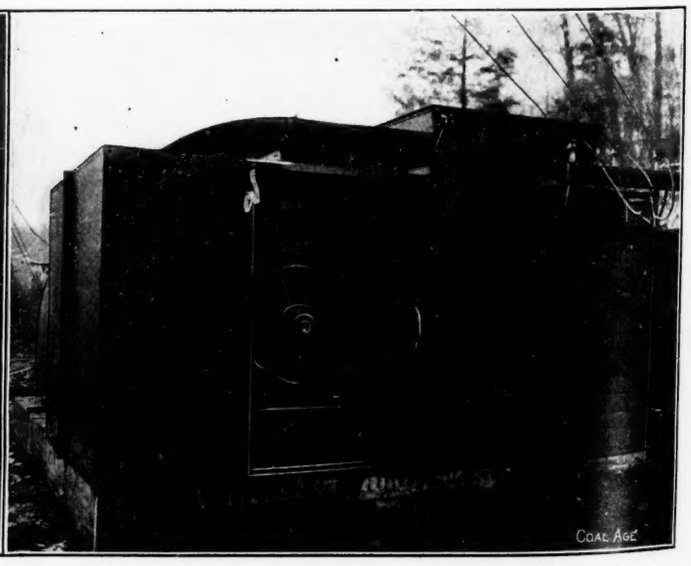


FIG. 8. J. C. STINE FAN DRIVEN BY WESTINGHOUSE ALTERNATING-CURRENT MOTOR

ELECTRIC LOCOMOTIVE HAULAGE AT PENN-MARY MINES

Mine numbers	Weight of locomotive	Average cars per trip	Trips per 9 hour day
1	15 ton	60	15
2	12	50	20
3	12	10	80
4	12	15	14
5	15	20	20

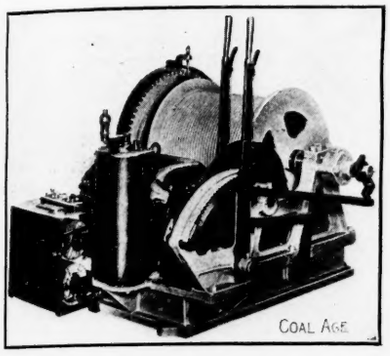


FIG. 9. LIDGERWOOD HOIST ELECTRICALLY DRIVEN

tipple to the dump an electric larry shown in Fig. 11 is used. In the illustration the larry is operating past the point to which the trolley wire is erected, and is taking its energy through the conductor cable. This cable is wound on and fed from a reel which is mounted under the larry and which is similar to that on a gathering locomotive.

ELECTRIC PUMPING

All the pumps in the Penn-Mary mines are operated by electric motors. In addition to the pump having a capacity of 2000 gal. per min. to which reference has previously been made, and which is located in Mine No. 1, there are several other pumps on the property operated by Westinghouse 250-volt, direct-current motors.

For instance, Fig. 5 shows a 7x8-in. Gould triplex pump located in Mine No. 2. It is operated by a Westinghouse 7½-hp. shunt-wound, 590-r.p.m., 220-volt motor which takes a full load current of 28.7 amperes.

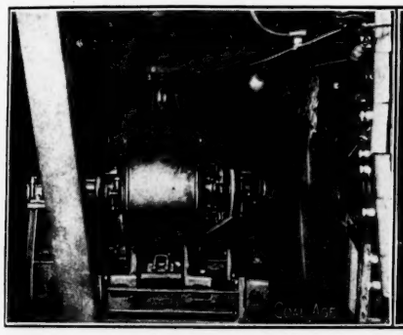


FIG. 10. UNDERGROUND MOTOR OPERATING AN ALDRICH PUMP

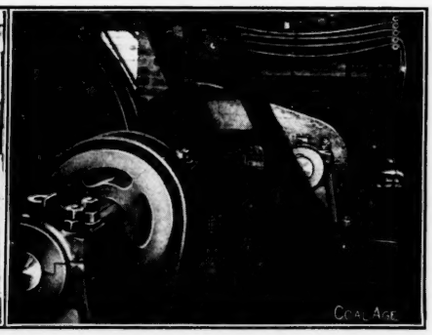


FIG. 12. A LIDGERWOOD HOIST, WITH AN ELECTRIC DRIVE

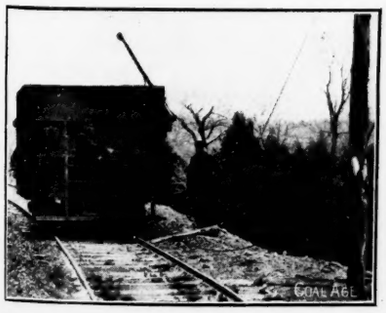


FIG. 11. A ROCK-DUMP LARRY WITH SUB-FRAME CONDUCTOR REEL

In the main headings the grades average 5 per cent. The maximum grade is 16 per cent. and is situated in the main entry to No. 3 mine, but a hoist is used to pull the trip up this entry. The Lidgerwood hoist (Fig. 12) used for this service is driven by a 200-hp. Westinghouse mill-type motor equipped with a Westinghouse magnet-switch control. The hoist pulls the trip up the entry for a distance of about 1000 ft. and the empty cars haul back the hoisting cable.

For hauling slate from the No. 3 mine Fig. 10 shows a Westinghouse 40-hp. 220-volt, 550-r.p.m. motor which drives an Aldrich 8x9-in. triplex pump. This is in No. 2 mine and is known as the town-dip pump. It is not visible in the picture but is located just to the rear of the motor. The motor is controlled by an automatic float switch which starts it into action when the water in the sump reaches a certain level. The pump is automatically stopped when the water is drained down to the required elevation.

VENTILATING FAN MOTORS

At No. 2 mine there is installed a J. C. Stine fan (Fig. 8) driven by a 100-hp., Westinghouse, 2200-volt, 60-cycle motor with a Morse chain belt.

The fan which operates at 150 r.p.m. furnishes 140,000 cu.ft. of air per min. at 2¾ in. water gage. An interesting feature in connection with the installation of this fan is that it was placed in service in one night. The daily work in the mine was not interfered with in the least. The fan is giving excellent satisfaction to the management of the Penn-Mary mines.

Official Call
for
First Meeting
of the
Rocky Mountain Coal Institute.

E. H. Weitzel, chairman of the committee appointed to arrange for the organization of a coal institute in Colorado, Wyoming, Utah and New Mexico, announces that the first meeting of the proposed new institute will be held in the House Room at the State Capitol, Denver, Colo., next Wednesday, Nov. 13. The organization committee will meet in Denver on Nov. 12.

Every coal man in the four states included is especially invited to attend the initial meeting and become a member of the new mining institute. Great good is sure to result from a better understanding and closer fellowship on the part of all those who are interested in the production of coal in the Central Rocky Mountain States.

Good Mine Maps Necessary

Economic mining is next to impossible without good mine maps. Five minutes' study of a map is often more profitable than weeks of investigation and work in the mines. Maps give a grasp of details, a sense of the relationship of locations, a sense of proportion, a unity of perception and a perspective of the vertical elevations not otherwise obtainable. They are also of untold aid in rescue work, in reëstablishing ventilation and locating the dead or injured. The miner who is familiar with the map of the mine in which he works knows at once the location of dangerous workings and the way of escape from the same. Maps should not be too full of details or so large that they cannot be seen as a whole at a single glance.

The lignite coal of the West varies greatly in character and appearance, improving gradually toward the west. In Dakota it is brown, woody and lustreless; in Montana it is black but lustreless, while in Wyoming it shows no indication of woodiness and has a brilliant lustre.

A Nicola Valley (B. C.) Colliery

By Charles Graham*

A brief description of the Nicola coal basin, underlying the junction of the Nicola and Coldwater valleys, British Columbia, Canada, together with a reference to the leading geological features of the basin. The No. 1 and No. 2 mines and tipples of the Nicola Valley Coal and Coke Company, Ltd., described. The Middlesboro Draeger training class, organized for mine rescue work.

*Superintendent, Nicola Valley Coal & Coke Co., Ltd., Middlesboro, B. C., Canada.

The Nicola Valley Coal & Coke Company's mines are situated at Middlesboro, near Merritt, B. C., Canada, in the Nicola Valley. The Nicola Valley lies south and east of the main line of the Canadian Pacific Railway, which, going west, makes a sharp bend to the south, at Ashcroft. As shown on the accompanying map, Fig. 1, a branch line of the railroad extends from Spences Bridge, up the Nicola Valley, 47 miles to Nicola Lake.

The coal basin lies in the Nicola and Coldwater valleys. The coal seams and associated strata are of the Tertiary age and rest upon volcanics of the Triassic age. Fossil specimens are rare. The surface of the country is heavily covered with a drift, consisting chiefly of clay with areas of sand and gravel in places. The deposit of coal covers not only the level portion of the basin, but reaches well up to the higher elevations on the surrounding hills. The denudation in the valleys and on the slopes has been heavy.

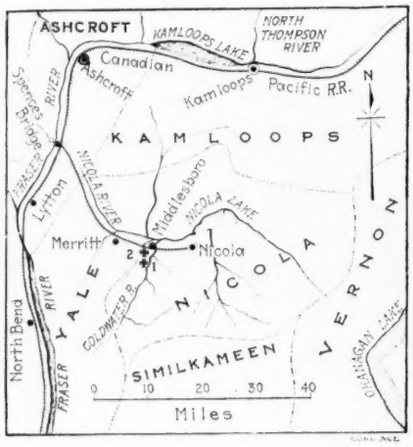


FIG. 1. MAP OF NICOLA DISTRICT

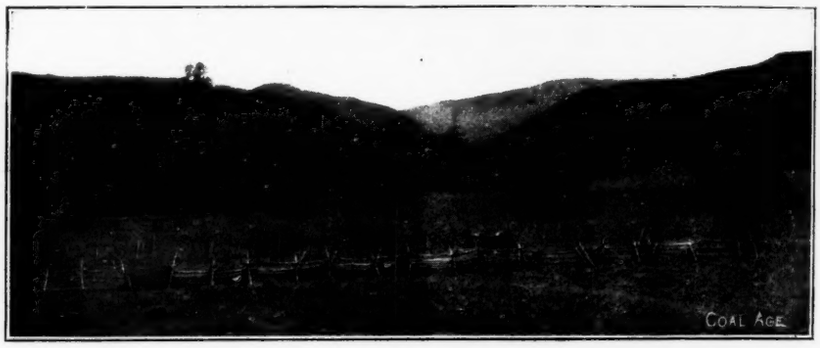


FIG. 2. NICOLA VALLEY LOOKING WEST FROM MOUTH OF COLDWATER VALLEY

The junction of the Nicola and Coldwater valleys is a broad fertile plane (Fig. 2). The length of the Nicola coal basin is about 10 miles and its average width about 3 miles. As previously stated, the sedimentary rocks composing the coal basin rest directly upon the volcanics and present no indication of overflow. The best natural section of the coal-bearing strata is seen in what is known as Coal Gully—a rugged ravine that cuts the face of the hills to the west of Coldwater Valley, and about 1 mile south of the forks of the Nicola and Coldwater rivers. Four coal seams are here exposed, with interstratified beds of gray sandstone, clays and shale. Between this gully and the contact with the volcanics mentioned, a distance of about 1200 ft., other outcroppings have been discovered; but no attempt has been made to correlate them with the outcroppings in the gully.

The Nicola Valley Coal & Coke Company, Ltd., owns 2660 acres of coal land, extending south, from Nicola Valley, up Coldwater Valley. With the present knowledge of the country, there are six seams of coal on the property, four of which outcrop in Coal Gully and two in what is known as Coldwater Hill, about half a mile east of Coal Gully. The dip of the seams in Coal Gully is south, while the dip of the seams in the Coldwater Hill is almost east.

On the Coal-Gully side the seam being worked at present is the top seam. This seam is about 10 ft. in thickness, with a soft shale roof and a sandstone floor, and has an average dip of about 25 deg. to the south. There are several dirt bands in this seam. The other seams in this hill are 12, 5½ and 5 ft. thick, respectively. Development work is being confined to one seam only, in order to thoroughly prove the ground before any extensive operations are undertaken in any of the other seams.

In Coldwater Hill, the seam that is being worked is about 5½ ft. thick and has a hard-shale roof and a shale floor. This seam is pitching about 22 deg., into the hill to the west. The other seam in this

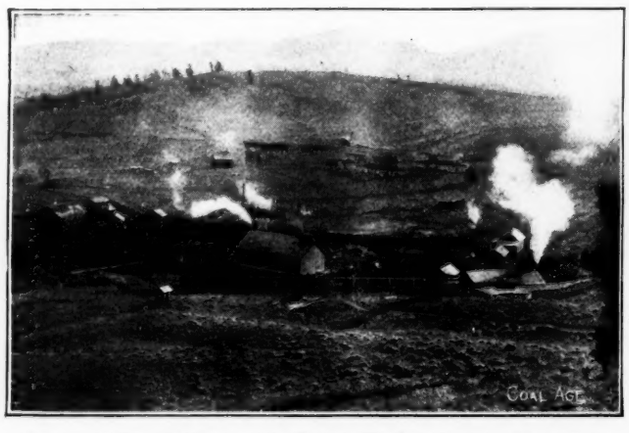


FIG. 3. NO. 1 TIPPLE AND CAMP IN COLDWATER VALLEY

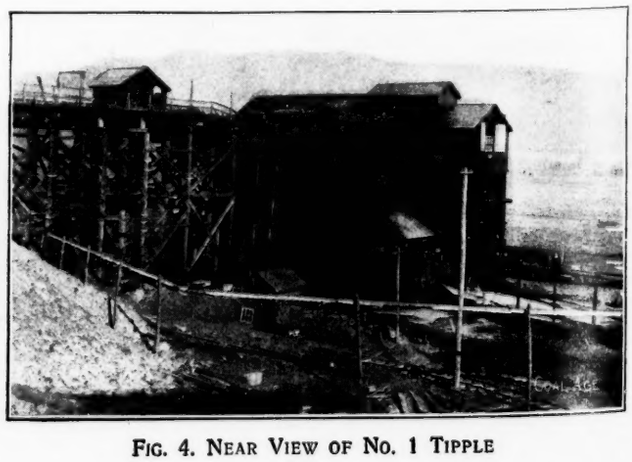


FIG. 4. NEAR VIEW OF NO. 1 TIPPLE

hill is but 30 in. thick and is not being worked. Several diamond-drill holes have been put down which prove the continuity of the seams.

In Figs. 3 and 4, are shown two views of the main No. 1 tipple, located in Coldwater Valley. The output of the company, at the present time, is about 500 tons a day, about 300 tons being taken from mine No. 1, on Coldwater Hill, and 200 tons from mine No. 2, in Coal-Gully Hill. An extensive scheme of development is being carried out, which, in time, will make this property a heavy producer. The seams are all coking coals and yield a firm coherent coke. No coking is being done, at the present time, owing to the distance of the plant from the markets. With the building of the Kettle Valley Railway, which is now under construction, access will be given to the smelters of the Boundry country, which will make the manufacture of coke worthy of consideration.

Mining is done on the room-and-pillar system. Haulage inside the mines is performed by mules, on the level roads, and by compressed-air hoists, on the dips. At No. 2 mine, the coal, after being hoisted up the slope, is hauled to the No. 1 tipple, by a steam dinky. The tracks from both mines join at the tipple approach.

Fig. 5 is a general view of the plant at No. 1 mine, which consists of four 150-hp., return-tubular boilers, 6x18 ft.; one Canadian Rand cross-compound air compressor having a capacity of 2000 cu.ft. of free air per minute and one 27½ kw. generator, which is used for lighting purposes. At No. 2 mine there is one 150-hp. boiler of the same size and type as those at No. 1 mine, and one Canadian Rand, straight-line air compressor, simple steam and compound air, having a capacity of 600 cu.ft. of free air per minute.

Water is supplied by a Canada-Foundry-Company pump stationed alongside the river, at No. 2 mine. This pump has a capacity of 750 gal. per min., and pumps water into storage tanks, which have a capacity of 60,000 gal. and from which water is distributed to the entire plant and houses.

No. 1 tipple (Fig. 5) was erected by Roberts & Schæfer Co., Chicago, during the summer of 1911. The tipple has a capacity of 100 tons per hour and is of wood construction. It is equipped with a Philips cross-over dump; a pair of shaking screens; a picking table; a Stewart coal washer, with settling tank and elevators for elevating fine coals; a revolving screen on top of the coal bunkers, for separating fine coals; and a conveyor line extending along the top of the bunkers, for conveying coal to the bunkers.

Four grades of coal can be made, and the conveyor is so arranged that the coal from the picking table and revolving screen can be put either directly into the bunkers or carried by the conveyor, to the loading chutes. Any grade of coal can be loaded separately, or any desired mixture of the various grades can be loaded. A portable Christy box-car loader is used for loading. The capacity of the bunkers is 350 tons.

A Draeger-training station is maintained, at the mine, where instruction is given both to officials and miners, in the use of the apparatus. An interesting feature in connection with these collieries is the Draeger class, Fig. 6, organized for the purpose of rendering first-aid or rescue work, in the mine.

The names of the Draeger team, reading from the left, are as follows: Frank Bond, attendant; Peter Myers, R. D. Brown, Chas. Graham Supt., Alex. Ewart, Amd. McKendrick, John McDonald. Back row, David Brown, Overman No. 1, Robert Fairfoull, Overman No. 2. All the others are firebosses from the two mines.

FIG. 5. NO. 1 TIPPLE, YARD AND BUILDINGS; COLD WATER VALLEY LOOKING NORTH TO NICOLA VALLEY IN DISTANCE

FIG. 6. MIDDLESBORO DRAEGER CLASS, 1912

Since its organization the team has done much good work in becoming acquainted with the use of the apparatus required and have maintained a regular drill, whereby their efficiency has been increased. Our constant aim is to bring the equipment of the collieries up to date in every respect.

Prevention of Blownout Shots

An English method for preventing blownout shots consists of the use of an argillaceous cylindrical plug. This plug is perforated its whole length several times, then soaked in water for several minutes until it has absorbed half its weight in moisture, then it is rammed into the hole on top of the charge. No moisture drips from the plug when removed from the water. It is obvious that this amount of moisture on top of a cartridge cannot but act as an aid in the prevention of gas explosions due to blownout shots in gaseous mines. It is claimed that the use of this plug, followed by dry tamping, renders a blownout shot impossible, for the tamping if properly rammed home becomes as hard as the material to be blasted. Detonator wires cannot be cut or damaged by the plug while stemming, as it is of a very soft nature. The efficiency of the explosive is increased 15 per cent. or over and the coal is not broken into fine sizes. Tamping in this manner takes about half the time required to tamp with clay.

Current Coal Literature

The Best Thought Culled from Contemporary Technical Journals, Domestic and Foreign

What is Anthracite?

William Griffith and Eli T. Conner, in an article read before the Congress of Applied Chemistry, thus defines anthracite:

"An arbitrary division line between anthracite and bituminous coal has been adopted by scientists, based upon the relative proportions of the volatile matter and fixed carbon contained in them, which is known as the fuel ratio. Coals in which the volatile matter is one-eighth of the fixed carbon, or less, are said to be anthracitic in character, while those having a higher proportion of volatile matter have been classified as bituminous.

Lack of Agreement Between Trade and Scientific Definitions

"While this distinction may serve for scientific purposes, it will not answer for the practical everyday uses of the coal trade and the consumer. Therefore, a hard and fast adherence to this arbitrary separation between coals cannot be maintained in commerce.

"Both in Pennsylvania and elsewhere, there are coals which fall upon the bituminous side of the above classification, and yet are smokeless. They have the physical characteristics of anthracite, and may be prepared in sizes, shipped and sold for domestic purposes as anthracite coal, and are so considered and classed by the trade and consumer.

The Important Question: "Does it Smoke?"

"The one great division line between bituminous and anthracite coal, so far as its domestic use is concerned, is that which divides smoking and nonsmoking coals. Consequently, all coals which burn without perceptible smoke should be included for economic reasons by the conservationist, under the general term anthracite.

"This line between smoking and smokeless coals is not fixed, but varies more or less around 12 per cent. of volatile matter in the coal content, and is probably affected to a certain extent by the relative quantity of the other ingredients contained in the coal. Therefore, for certain purposes, anthracite coal may be defined as any mineral coal which will not smoke, when burning in a smothered fire.

Classes of Anthracite

"Anthracite has been derived, through a natural coking process, from bituminous coal, and on account of the extent or degree to which the metamorphosis has been carried, we recognize different grades of anthracite, namely: The softer, semi-anthracites, which contain considerable volatile matter; the harder or dry anthracites, which contain a medium quantity; and the very hard, or graphitic anthracites, in which the coking process has continued to the point where some of the carbon has been changed to graphite.

"The latter have the usual graphitic luster, are difficult to ignite, and when once ignited, burn at a high temperature and require plenty of draft. The "dry" anthracites may be recognized, usually, by their hardness and bright luster. They burn with a hot, slow fire, without flame, and, like the graphitic anthracites, have more or less tendency toward the formation of clinker in the ash, under intense heat.

Advantages and Disadvantages of Free-Burning Anthracite

"The semi-anthracite, that is, soft or free-burning anthracite, as it is better known to the trade, has a dull luster, and the nearer it approaches to bituminous coal, the duller its appearance and the softer its nature. It also burns with a short blue flame, without smoke. In some of the softer varieties the flame is longer and is tinged with yellow.

"It requires less draft, and usually burns away to a fine, feathery ash, leaving a few clinkers. As it is softer, it produces more dust in handling, and on this account it is not so much liked by the portion of the coal trade which is accustomed to the harder varieties. By others, however, it is much preferred on account of its free-burning, quick-firing qualities and its light ash."

Wireless Telephony in Mines

Undergound wireless telephony is a new system of communication in mines which is being tried in Germany, and if it acts as well as the present information tends to show, it should mark a really significant advance in methods of message transmission. It is not the same thing as would be ordinary wireless employed subterraneously, but depends on quite a different principle.

The electrical waves are transmitted not by the ether, but by the solid conductors existing in shafts and galleries, such as wire cables, rails, pipe and moist dust. These, it must be understood, are not employed as are electrical conductors in ordinary closed circuits, but may be used inductively without actual contact at the stations, and without need that the continuity of metal be absolutely unbroken.

A system making use of the rails, pipe lines, cables or other conductors in the mine. The circuit need not be continuous as the current will easily jump from one conductor to another.

The advantage of such a system is obvious when it is considered that it would probably remain intact after disasters which would completely disable or destroy an ordinary metallic circuit.

Note—Translated in abstract from Glückauf by E. P. Buffet.

Whereas the surface crust of the earth is a condenser of practically unlimited capacity, the rock strata at considerable depths underground form insulators, which fact helps to explain why the waves can be transmitted through such casually laid conductors as pipes or rails without becoming dissipated.

The availablility of these media gives underground wireless telephony some decided advantages over the daylight system. It can be performed with much weaker currents (12-volt battery currents as against the 220 volts used above ground) and with simpler instruments, and it has rendered possible a solution of the alarm difficulty, which

hindered the perfection of superterranean wireless.

The present description is translated in abstract from a paper presented at the recent mining celebration in Vienna, Austria, by Mine Assessor O. Dobblestein of Essen, Germany, as published in *Glückauf*. The system is now installed at the Carolinenglück pit, near Bochum, Germany. At the instance of Herr Ufer, engineer at that mine, it was worked out through painstaking experiments by Herr Reinecke, engineer, of Bochum.

Connection Between Cage and Engine Room

One of the applications of the system is to shaft telephony between engine room and cage through the hoisting cable. In this case a physical electrical contact with the rope is established at the cage end, although the connection at the upper end appears to be inductive only.

As outlined in Fig. 1, there is mounted in the shaft a loop conductor *L*, connected with a battery of cells and microphone *T* in the engine room. The electric vibrations produced by talking in this circuit induce currents in the hoisting rope, which with the tail rope and metal connection between the sheaves forms a closed conductor. Then at the cage, by shunting the Telephone *T'* and batteries *B'*, between the ends of the head and tail ropes, communication may be established with the engine room.

Mine Telephony

Turning from the shaft application of this wireless system to the mine telephony proper, dependence is placed on the numerous rails, pipes, etc., which form an imperfect conducting system, but one so insulated by the surrounding rock that even for comparatively small static electrical charges, they can be used directly as conducting lines, and indeed short interruptions of rail or pipe are jumped over.

These lines are statically charged by means of a closed circuit of 12 volts and about 0.5 ampère, in which are introduced a microphone as transmitter and an induction apparatus, which transforms the intermittent current produced by speaking in the microphone to one of 1000 volts. Thus, small, high-tension, high-frequency currents are made to pulsate through the imperfectly connected network of conductors in the mine, instead of being thrown into the surrounding ether. Because of this property the conducting lines can be interrupted at several points without destroying the coherence or direction of the electrical waves.

There are three arrangements by which these static vibrations may be discharged from the sending antenna, as shown in Fig. 2. It is here assumed that the pipe *P* leads down from above ground. The simplest case is shown by the arrangement on the lowest level where the static charges are led off from the piping *P* (the sending antenna), to the rail *R* through the primary of an inductive winding, in the secondary circuit of which is connected the receiving telephone *T*.

At the intermediate level is arranged, on the sending antenna *P*, a shunt the length of which varies according to the distance from the transmitter *T* above ground, and in practice is, say, from 17 to 33 ft. On the highest level no conductor is connected with the piping *P*. Here a wire loop serves as receiving antenna for the telephone *T*.

Call System

The chief difficulty with this system lies in the construction of a suitable call. After many failures, Reineke has succeeded in devising a satisfactory bell alarm. Its operation depends on producing an electrical wave of definite frequency. The vibrations thus produced are taken up at the receiving station by a diaphragm tuned to them. The earlier constructed calls, over the diaphragm of which was placed a point held by a spring, did not work reliably, since the tension of the diaphragm was affected by its temperature, wherefore the point touched continuously or not at all.

Fig. 3 shows the construction of the new call. A certain wave vibrates the diaphragm *D*. Over it is pivoted a counter-balanced contact lever *L*, with point *P* resting against the diaphragm when there is no vibration, and irrespective of temperature effects. This point cannot follow the vibrations (owing apparently to the inerita of the lever). In consequence of which the weak current that is constantly passing between point and diaphragm when at rest becomes interrupted, by vibrations, which releases the spring armature *A* of the magnet *M*, thus closing a second circuit in which lies the bell *B*.

At first, trouble was experienced from frequent breakage of the contact between point and diaphragm by mechanical jars, which thus rang the alarm. To overcome this difficulty there was inserted in the second, or bell circuit, a retarding relay *R*, so that the signal circuit can be closed only by long, or frequently repeated breakages of contact with the point, such as are produced by a continuous vibration of the diaphragm. The bell therefore does not ring until the vibra-

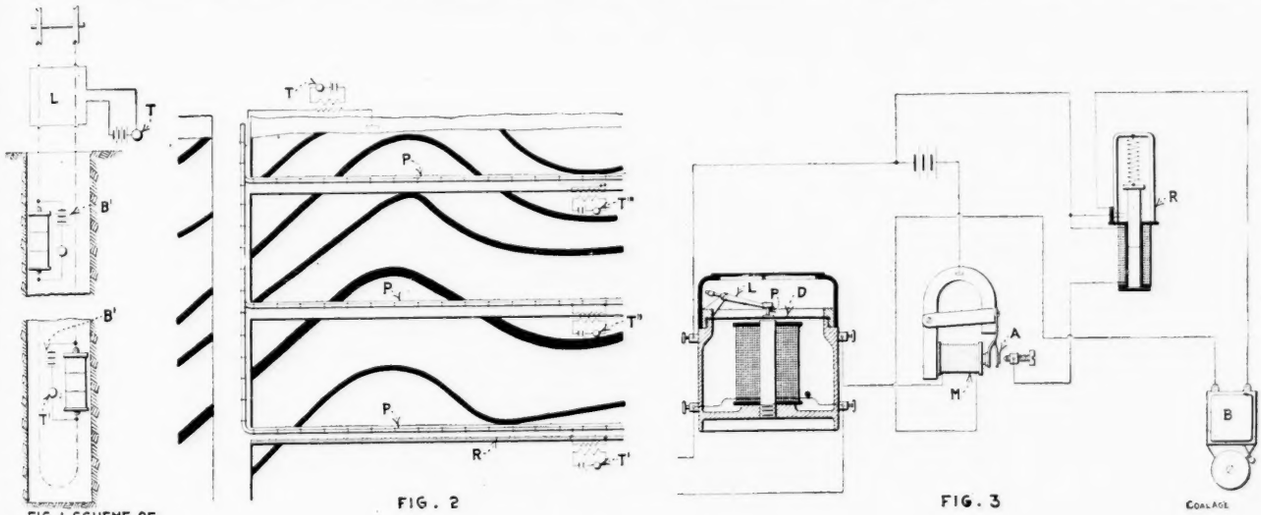


FIG. 1 SCHEME OF SHAFT TELEPHONE

FIG. 2

FIG. 3

Wireless Telephony in Mines

tor of the transmitting station has acted for a certain length of time. This produces electrical vibrations in the piping system of the mine, which are caught by the receiving station and transmitted to the diaphragm of the alarm. In this way it is possible, by introducing at the transmitting station vibrators producing different pitches, to call severally a whole series of receiving stations without disturbing the other alarms of the same system.

THE TEST OF USE

In the Carolinenglück mine a telephone system of this sort is regularly in use. It reaches from the superintendent's office above ground to a distance of a mile from the shaft. Experiments have shown that it is not interfered with by the electrical power system installed in the mine, provided no direct metallic connection exists, since the electric power currents are of low frequency and voltage compared with those existing in the antenna of the telephone system. Further, there is believed to be no risk of accidentally firing shots as a small condenser is used to prevent sparking at the vibrator.

Besides many other advantages which a wireless possesses over other mine telephone installations, it may remain serviceable after disasters which would totally wreck conducting wires.

The system described is exploited in Germany by Salau & Birkholz, of Essen.

Miners' Convention at Pottsville, Pa.

Special Correspondence

The Annual Convention of the Ninth District, United Mine Workers of America, opened on Oct. 15, in the Pottsville Court House, with President John Fahy in the chair; Secretary-Treasurer Richards, recorder.

The convention was attended by the largest number of delegates that has yet assembled since the organization has been effected. This fact is looked upon as evidence that the last adjustment between the operators and miners pleases the men.

The first important item of business was the election of officers. There were three candidates for president: John Fahy, of Shamokin, the present incumbent, James Matthews, of Shenandoah, and James Dando, of Minersville. For vice-president: John Strambo, Mahanoy City, and Frank Domalesky. For secretary-treasurer: Thomas J. Richards, Shamokin. For international executive board member: Martin Nash, of Glen Carbon.

A discussion on the alleged irregularity in recording the votes lasted several days, but at no time was it proved that there was any intent to defraud. It has been the custom that, when those present at a local meeting would cast their vote for any candidate, the secretary of the local would then cast the entire strength of the local for this particular candidate.

In justice to the successful candidate, Delegate Matthews, it must be said that the practice was long in existence before he became a candidate for office. In a clear-cut speech, on the floor of the convention, he stated that he was not only willing but anxious to have the election referred to a referendum vote of the entire Ninth District. President Fahy joined with him in asking that the convention hold another election at its earliest convenience.

It may be well to state that at no time in the convention was it officially announced that Candidate Matthews was victorious. The press accounts, claiming a majority of over 5000 for him, were not authentic. Only two locals had their votes recorded in the convention when the debate that lasted for several days came up and terminated in the motion, which was carried, to have the election held in the week of Nov. 25, after which the convention would reconvene at Pottsville, on Tuesday, Dec. 10, to record the vote.

The charge, contained in one press dispatch, stating that President Fahy was the recipient of money from the Philadelphia & Reading Coal & Iron Co., and that he failed to stand firmly for the rights of the members of the organization, was thoroughly dispelled at the end of a three days' heated discussion, and the convention, by a unanimous vote, recorded their confidence in his integrity.

According to the report of President Fahy, the numerical strength of the organization has increased from 4000 to 35,000 since the award of the Anthracite Strike Commission and the settlement of the difficulties in the early part of the year. The report was a complete review of all concessions made by the operators since the last decade.

The report of Secretary-Treasurer Richards contained the following data:

Receipts for the year, per capita tax from Oct. 1, 1911, to Sept. 30, 1912	$11,795.15
Receipts from initiation fees	40,510.37
Miscellaneous receipts	15,687.79
Total	$67,993.31

To this is added $1,283.80, making a grand total of $69,271.11.

It was rumored that Myles Dougherty, a district organizer, receives an annual Christmas present of $1000 from Andrew Carnegie. James Maurer, of the state legislature, was quoted as the authority for the statement. After an extended debate, it was decided to summon "Mother" Jones, from West Virginia, and Terrence Ginley, of Girardville, to the December convention, for the purpose of testifying as to the truthfulness of the accusation. It was further charged that Delegate Dougherty had assisted in defeating the bill for the repeal of the state constabulary. This question will also be investigated in the December convention.

On a motion of Myles Dougherty, the convention unanimously voted to send $5000 to the West Virginia strikers. Various locals also signified their intention to make individual contributions, as much as $150 being sent by some of the locals in the district.

Delegate Norton, of Minersville, startled the convention with the statement that representatives of the coal companies were circulating among the delegates in an effort to have them go on record to reconsider the motion to destroy the contents of the ballot box. He failed, however, to present any tangible evidence to substantiate his charge.

A long debate centered around the resolution recommending that all locals be confined to one colliery. It was finally lost by a vote of 100 to 72. However, it was suggested that the matter be further referred to a referendum vote of the miners, so that it will again come up for discussion in the December convention. The resolution instructing the board members to visit the locals once a month was reported adversely; the report being concurred in by the convention.

Although the delegates gave ample evidence that they are wide awake to the fact that the aim of their organization is to advance their economic conditions, they clearly show that they have nothing in common with the advocates of Industrial Unionism, as the effort to have an advocate of the Industrial Unionism address the convention was turned down. Furthermore, a resolution was introduced donating $50 to the employees of the Coombs Garment Factory, to enable them to fight an injunction issued by Judge Brumm several months ago, and it was voted down.

That the organization is not in sympathy with the tactics of the Socialist Party was further evidenced by the refusal of the convention to entertain a motion indorsing the tactics of the Socialists.

A resolution was adopted, asking that the convention endeavor to have a repre-

sentative upon the Relief Board of the Philadelphia & Reading Coal & Iron Co. Inasmuch as this fund is maintained by the wages of the miners, it is but proper that they should be accorded representation thereon.

A committee of three were appointed for the purpose of ascertaining what can be done to have a State Mine Bureau Institute, with departmental heads, for the bituminous and anthracite fields, with a salary of $3000 per annum. The heads of the departments to be elected as are other state officers.

A New Oil Switch for Small Plants

A new oil switch designed for service in small plants has lately been placed on the market by the General Electric Co. This is known as the type F, form K-13 and will provide adequate protection on alternating-current circuits where the maximum capacity is not over 200 amperes and the maximum potential not over 3300 volts.

Description

Each of these switches is a self-contained unit with bushings, studs, contacts, mechanism and oil vessels all supported from one frame. The oil vessel is fastened to the switch frame by bolts, the two in the rear being provided with wing heads which readily pass through slits in the frame while the one in front is hinged and provided with a wing nut, thus permitting quick and ready removal of the oil vessel for inspection of the switch.

The vertical studs which conduct the electricity into the switch are of dropped-forged copper and are insulated from the frame by a two-piece porcelain bushing, one part of which is above the frame while the other is below it. By screwing up the nut at the upper end of the studs the porcelains are securely clamped to the frame forming a rigid support for the studs.

The contacts at the lower end of the studs consist of flared fingers of drop-forged copper secured to the stud by flat steel springs and copper laminations. The movable "blade" which forms the portion of the circuit between the two studs of the same circuit when the switch is closed, is made up of two pieces fastened together so as to be in the form of a wedge.

This wedge-shaped blade is connected to the operating mechanism by a wooden rod specially treated so as to give it high insulating power. On account of their shape and the manner of their operation, the contact parts have a scouring effect upon one another in opening and closing and so their surfaces are always clean and in perfect contact.

The wedge-shaped movable contact blade drops downward under the influence of gravity with the assistance of a spring when the circuit is opened, insuring prompt and dependable action. The current is ruptured between the flared portion of the stationary contacts and the upper extremity of the movable contact blade, thus protecting the parts which

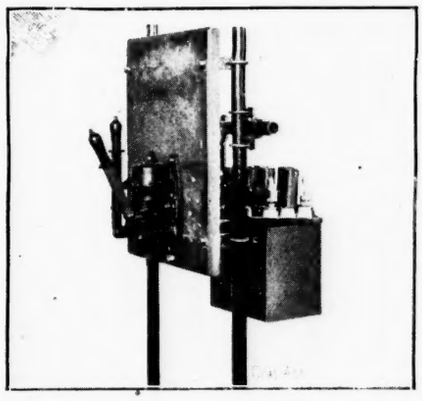


Fig. 1. Automatic, Double-throw Switch on Panel Supports

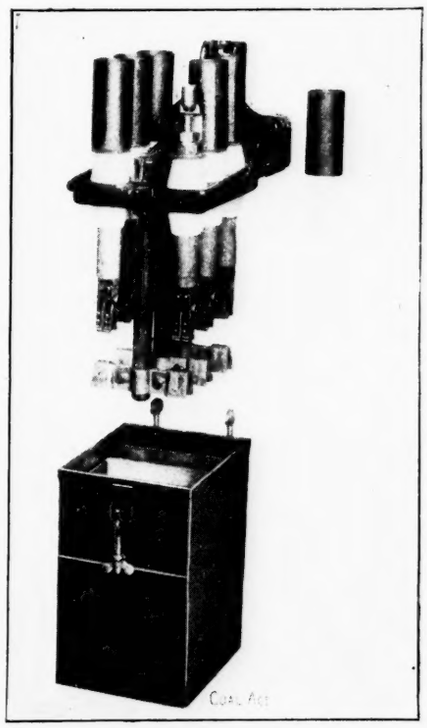


Fig. 2. Switch with Oil Vessel Removed

are in contact when the switch is closed from being roughened by the arc and insuring long life of these parts. The contact fingers and movable contact blade are easily replaced when necessary.

The oil vessel is of heavy sheet metal. It is lined with an insulating material and provided with insulating barriers between the circuits of different polarity effectually preventing an arc forming between the latter.

The switch is closed by means of a handle mounted directly on the front of the panel.

Both Automatic and Nonautomatic

This switch is supplied in both automatic and nonautomatic designs. The nonautomatic switch is held closed by a latch and is opened by pressing a button in the end of the operating handle.

In the automatic type, when the circuit becomes overloaded, the movable core of the horizontal lever of the tripping coil, instantly forces up a hinge-like attachment of the horizontal lever of the operating mechanism, allowing this lever to slide forward until its slotted portion projects beyond the handle, thus indicating that the switch has been opened automatically, the handle remaining locked in its closed position. By pressing the push button in the top of the handle, the latter is released and drawn toward the operator, the hingelike attachment, at the same time, dropping into its normal operating position. The switch can now be closed by moving the handle forward until it locks, unless the circuit is overloaded, in which case the tripping device forces the hingelike attachment up as described above and the switch cannot be closed.

The automatic type of switch can also be provided with a trip coil which will open the circuit if the voltage falls below the value for which this device is set. This insures the circuit being opened instantly in case the power should go off, and protects large motors against full voltage restoration of power and the line against sudden overloads due to all motors being started up at once.

The Diamond Vale Coal & Iron Company

We are advised by an official of this company that the statements published in our issue of Aug. 24, regarding the integrity of this concern, are in error. And further that these were due to the animosity borne the management by Mr. Creen, due to the trouble he had with it. Pending the conclusion of a thorough investigation, which we are now conducting, we feel in justice to the company and its officials, that the following remarks of B. P. Little, who was in active charge of the concern during the period in question, should be published:

Mr. Little states that the company did not own or operate a store during the period from March, 1906, until January, 1910, nor did they erect a hoist or plat a townsite. That the abandonment of the shaft was due to the financial stringency, general throughout the country during the latter part of 1907, and that while the boilers were in a rather dirty condition, having been in continuous operation for some three months, they were not by any means in such shape as described by Mr. Creen. Also, that the hoist was never in charge of a butcher, nor did the company ever go into liquidation.

Who's Who—in Coal Mining

Devoted to Brief Sketches of Prominent Men, Their Work and Ideas

The word pioneer we tend to apply to those who are facing the primitive conditions in an industry. We forget too often that pioneering is as possible now as it was one hundred years ago. The new idea had to struggle against suppression just as strenuously as in this year of grace. The introduction of mining machines in the hard-coal regions, the use of power drills, new methods of silting and of pillar robbing are pioneering efforts which in future years will carry honor with them.

Among early pioneers in the mining industry may be mentioned with much regard, Major Irving Ariel Stearns. His claim to the title is not due to his lack of preparedness for his task, a feature only incidental to pioneering and not a part of it. He brought a trained mind to bear on mining problems, but he has the qualities and record rightly associated with the title of pioneer.

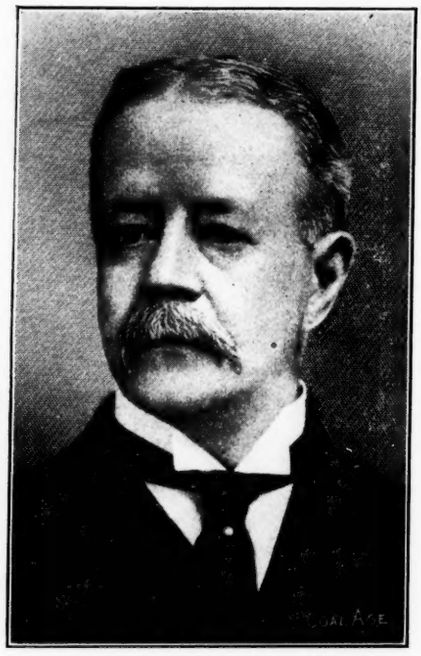
By his influence and from his fertile brain, sprang many of those improvements we regard now as commonplace, so firmly are they accepted. From his personal contact, some of the brightest minds now directing the future of the anthracite region derived encouragement and impulse.

Major Stearns comes of New England stock and his ancestry dates back to early puritan days, almost to the landing of the Pilgrim Fathers. He is an eighth descendant in a direct line from Charles Stearns who was admitted freeman of the village of Watertown in 1646. It is recorded that he was owner of a house, lot and other lands, was elected taxgatherer and constable but refused to take the oath.

The major is the son of George W. and Miranda Tufts Stearns. He was born in Ontario County, New York, Sept. 12, 1845. His father was a prosperous farmer, a justice of the peace and justice of sessions, the latter office being in its day of great dignity but it is now abolished.

The early education of the major was acquired in the public schools, later he entered the Rensselaer Polytechnic Institute from which he graduated in 1868. After receiving his diploma, he became an assistant professor at that school, but after a year he resigned to accept a position in the office of R. P. Rothwell, also a graduate of the same institute. Rothwell was then a mining and civil engineer of Wilkes-Barre, Penn.

In 1871 and 1872, Mr. Stearns was superintendent and engineer of the McNeal Coal & Iron Co., of Schuylkill County. When, however, Mr. Rothwell decided to go to New York as coal and iron editor of the *Engineering and Mining Journal*, of which he later became editor and part owner, Mr. Stearns succeeded to his practice and continued as an independent engineer till June, 1885.



IRVING A. STEARNS

Among other engineering tasks was the construction of a railroad and bridge across the Susquehanna River at Shickshinny. He was in charge of construction of an iron bridge across the same river at Pittston and he had control of the Lehigh Valley Coal Co.'s farms at Buffalo.

But meantime he was engaged extensively as engineer for many of the larger coal companies and he made many examinations and reports on mining properties in Pennsylvania, West Virginia, Arkansas, Colorado, Wyoming, Idaho and Utah.

In 1885, the Pennsylvania R.R. made him general manager of its many collieries in the anthracite region and he filled this position till 1897. It was when in charge of this work that he came in personal touch and sympathetic intercourse with those younger men whose memory of Major Stearns amounts almost to veneration.

In 1897, he resigned to become president of the Cross Creek Coal Co., Coxe Bros. & Co., incorporated, the Delaware, Susquehanna & Schuylkill R.R. Co. and the Coxe Iron Manufacturing Co. These positions he still holds.

He had a taste for military training and enlisted in the Ninth Regiment, National Guard of Pennsylvania, with headquarters in Wilkes-Barre, Penn. He was commissioned a quartermaster Mar. 29, 1880, and on May 5, 1884, was promoted to major. He served in this capacity till 1885 when he resigned.

Major Stearns is a director of the Wyoming National Bank, the Vulcan Iron Works of Wilkes-Barre, the Standard Trust Co., the Hibbard-Ely Safe Co. of New York City, the Pennsylvania Canal & R.R. Co., the Lehigh Valley R.R. Co., and the Temple Iron Co.

He is a member of the American Institute of Mining Engineers, the American Society of Civil Engineers and the Pennsylvania Society of the Sons of the Revolution. He is also president of the Ninth Regiment Armory Association of Wilkes-Barre. In 1892 he became one of the five trustees of that body and with the help of a few others he raised sufficient money to pay off the mortgage on the property.

Major Stearns' experience in his early years, covered a broad field of engineering so that he came to his mining work with an open mind, prepared to bring mine development into line with out-of-door practice. There is room underground even today, for men who cannot find reasons for a belief in our traditional practices, but who seek to cut out a new and shorter path to results.

If the various phases of our industrial and professional life did not mutually act and react, our progress would be slow and halting. Though specialization is valuable, it may be carried too far as sometimes the very intentness with which we view an object may impair our perceptions of its essential features.

Then it is that a man of wider practice who has gained from his more distant view an impression of the whole which is more just and true, will be able to effect even more than an expert, who has had a closer acquaintance with the matter at issue. In this way, men like I. A. Stearns fill a place in the industry of considerable importance. When specialization has advanced any of the industries, an occasional man is needed to translate its achievements to operations in another sphere and to make those modifications which the occasion demands.

Issued Weekly by the
Hill Publishing Company
JOHN A. HILL, Pres. ROB'T McKEAN, Sec'y.
505 Pearl Street, New York.

Monadnock Bldg., Chicago.
6 Bouverie Street, London, E. C.
Unter den Linden 31—Berlin, N. W. 7.

FLOYD W. PARSONS, Editor.

Correspondence suitable for the columns of COAL AGE solicited and paid for. Name and address of correspondents must be given—not necessarily for publication.

Subscription price $3 per year in advance for 52 numbers to any post office in the United States or possessions, and Mexico. $4 to Canada. $5 to any other foreign country.

Subscribers in Great Britain, Europe and the British Colonies in the Eastern Hemisphere may send their subscriptions to the London office. Price 21 shillings.

Notice to discontinue should be written to the New York office in every instance.

Advertising copy should reach New York office by Thursday of week prior to date of issue.

Entered as second-class matter, October 14, 1911, at the post office at New York, New York, under the act of March 3, 1879.

Cable Address, "Coage," N. Y.

CIRCULATION STATEMENT

Of this issue of Coal Age, we will print 9500 copies. No copies will be sent free regularly. There will be no back numbers. The figures shown here each week represent live, net circulation.

This journal is interested solely in matters relating to the fuel industries, and is designed to be a medium for the free interchange of ideas, the detailed description of coal-mining practice, and the expression of independent thought calculated to benefit both operator and miner.

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COAL AGE

Consideration Of The Mine Cave Problem

One of the most serious problems that has confronted the coal-mining industry is the question of extracting the coal underlying valuable surface properties. This problem grows with the ever increasing demand for coal and its greater scarcity, as, year by year, the sources of supply are being steadily depleted.

In all coal-mining communities, more or less, the supply of coal has been so abundant that little or no attention has been given to close or exhaustive mining. In the early mining, the best of the coal has been taken out and wherever required ample pillars have been freely left to afford the necessary support of the surface. Prosperous communities of merchantmen and tradesmen, professional men and capitalists have settled on the surface, from beneath which much of their wealth has been taken. In many instances, the surface holdings represent the hard-earned savings of the laboring classes, who have laid by, week by week and month by month, their small surplus earnings.

Little heed has been given to the grave problems of the later mining, when the growing scarcity of the underlying coal makes it necessary to come back and mine out the pillars left for the support of the surface. It is this later mining of pillar coal and other reservations that has given rise to serious complications that demand the most careful thought and consideration.

There is, in the problem presented for solution, what has been styled, a "clash of equities," so to speak. Coal in the ground has no value, except it can be taken out and marketed. On the other hand, the value of surface possessions is often sadly depreciated by the exhaustive mining of the underlying deposits.

Has art any value in the absence of an appreciative sense? Have food, clothing, fuel or any of the numerous utilities of modern civilization any value whatever, except as they can be appropriated to the several uses for which each is designed? What is the value of a bag of gold at the frozen north or in desert wilds? No argument is required to demonstrate that *the value of all possessions lies in the use that can be made of the thing possessed.*

It may be an unwritten law, as far as the mine-cave problem is concerned; but, has a purchaser any power to waive an inherent right on which the value of his purchase depends? Does the vendor give value for value when he demands such waiver? Is such a waiver binding, notwithstanding the fact that it is written in and made a part of the contract of sale? In some cases that are of record, the entire surface possessions of the purchaser have been ruined and rendered valueless by the subsequent act of the vendor, under such waiver clause.

In all exchange, it is binding on both parties, alike, to give *value for value.* A promissory note is made to read "For value received, etc." It is common in all writings of agreement conveying a privilege, to state or name the consideration on account of which the conveyance is made.

It is a question whether there is a lawful exchange in a contract that contemplates the subsequent right of the vendor to damage the property that has become the rightful possession of the vendee. A waiver conveying such right would seem to have no legal or moral binding, because of its being contrary to the recognized and established principles of equity and justice.

The mine-cave commission of Scranton, Penn., is still grappling with the problem of securing to property holders of that city, adequate protection from the surface damages that threaten portions of the business and resident sections. The plan suggested by ex-Mayor Dimmick, who is a member of the commission, contemplates asking legislation that will afford relief. This plan should receive earnest consideration, in the hope that an equitable solution of the problem may be reached that will afford the much needed relief.

The Economy of Wire Rope Haulage

When the whole cost of production of coal is considered it is readily seen that, aside from the "breaking down of the coal," it is wholly a question of transportation, of moving a large volume of crude material longer or shorter distances in the most expeditious and economical manner.

It is a long stride from the Mexican peon carrying ore in a basket on his back, and from the pioneers of Fort Pitt, filling buffalo hides with coal and rolling them down the hill, to the modern two- or three-ton steel mine cars equipped with roller-bearing wheels, traveling in trains of 100 wagons, and drawn over first-class steel rails of heavy section by compressed-air or electric locomotives, at speeds of 8 to 12 miles per hour.

The problem to be solved at each coal mine when it is projected is: "What is the proper system of transportation to be adopted? What method will not only reach the ultimate limits of the territory to be exhausted, but will be most flexible and require the least changing as the work advances, and yet will show the lowest average cost and the highest efficiency over the whole life of the operation?"

Upon the proper determination of this question often depends the success or failure of the whole scheme. Mining men, like other human beings, are often led by fashions or fads.

The wonderful development of electric transportation has greatly benefited the mining of coal, and it has been so largely adopted that many believe it to be universally adaptable to all sorts of haulage problems.

This is sometimes quite a mistaken idea, for there have been many instances where highly efficient haulage systems of other types have been discarded and electric locomotives installed, at great expense and higher operating and maintenance cost.

Mistakes of this character are made where the operator or manager relies upon the information obtained from electrical catalogs, or on the silver-tongued salesman of a manufacturer of electric equipment. He would do better if he would base his decision on the advice of a disinterested and experienced engineer who is qualified to consider all the present and future factors of the problem.

Before rejecting or discarding wire-rope haulage, careful study should be made by the expert, as there are many properties which can best be served by such an installation. For instance, when the coal bed is worked to the dip and the average grade against the loaded trip is 4 per cent. and upward, even though there may be sections of the main road lying on lower grades or absolutely flat, the projections should be so made that when sufficient output has been assured, a properly designed and installed tail- or endless-rope system may be adopted.

It is true that combined traction and rack-rail electric locomotives have been developed capable of doing excellent work on grades up to 15 per cent., but when all the items of efficiency, power consumption, operating and upkeep expense, plus interest and depreciation, are considered, it will often be found that the balance is in favor of the wire-rope system.

The varying conditions to which wire rope is readily adopted were better known to engineers of 20 years ago than to some of the present generation, who "eat, sleep and have their being" to the accompaniment of electricity. What we wish to urge is the careful weighing of all the approved methods before the final adoption of any system of transportation.

Our Department of Current Coal Literature

There are people who desire to see only what is immediately around them, who are unwilling to read any but their own sentiments in print. We cannot understand such persons as are satisfied with the range of their own eyes and the sounds which fall on their own ears.

"Current Coal Literature" is not for such men. We seek into this department of the paper to crowd the views of every man worth hearing and the description of the practices of every clime. Some have said "America is good enough for me." Perhaps it is; but we hope he will not die of hydrophobia for lack of a Pasteur, or of smallpox because Jenner's work has no meaning for him. We trust that his Americanism will not cause him to writhe in inconsolable pain because morphine and opium are foreign drugs. We are positive that the surgeon who removes his appendix will not be so narrow as to refuse to cleanse his knife after the manner of Lister.

Sometime or other the teachings of the foreigner will travel across the water and if that teaching be valuable we shall be glad to be the craft by which it is conveyed.

Very few mining inventions in their essence were originated in the United States. Even where we excel, to wit, in mining machines, the English practice is older, although not so worthy of respect.

In many ways, foreign nations can teach us new facts about mining. The sailor may not know as much as the landsman, but his work makes him know more about tying knots and we go to him for training. The peculiar conditions, governmental, economical, geologic and stratigraphic give other nations a view of mining from an entirely variant angle from ours and have caused developments along totally different directions.

We may, without fear of contradiction, say that prior to the formation of the Bureau of Mines, the balance of good mining literature came to us from abroad. Even today it is probable that on the whole the bulk of such scientific information still comes to us by way of the Atlantic liners.

Our mining institutes, larger by far than theirs in attendance, do not produce nearly as much and as valuable material. We are not yet accustomed to the habit of abstract thinking nor are we so prone to write down that which we do think and know, as indeed this organ of the coal-mining profession only too well realizes. When we think, it is rather that we may act. We think as it were on our feet.

But COAL AGE seeks to give not only the ideas on mining elaborated by friendly foreigners but the ideas also of those not so foreign but immensely less friendly, namely, those who are not satisfied that the operator should throw them the bail but would like to have the bucket also—to wit, the ultimate consumers whose cry is like that of the horse leech—give, give, give.

Thus, in these columns, we reflect the views, sentiments and works of all sorts and conditions of men that everyone may glean some new ideas to test in actual practice.

Discussion by Readers

Comment, Criticism and Debate upon Previous Articles, and Letters from Practical Men

Should Mine Fans Be Built Reversible

Letter No. 13—The question of having mine fans so constructed that the air current may be reversed is one that is debatable along certain lines. I would say that, at certain mines classified with reference to the number of openings to the surface, it should be compulsory on the part of the operators of those mines, to install reversible fans. It may be that it will never be necessary to reverse the air current at a certain mine, while at another many lives might be lost because the air current could not be reversed in time to avert such catastrophe. It generally happens that when the air current should be reversed it must be done quickly in order to save life, and a reversible fan gives quick results.

I will discuss only the safety features at this time, and mention two cases that I think will demonstrate my point. A fire occurred in one of the mines in my district, ventilated by an exhaust fan, the main haulage road being the intake airway. The fire occurred at a gasoline pump, located on this haulage road. A 5-gal. can of gasoline was ignited, and it was impossible to get to the fire to fight it. The men and the mine foremen were in the mine at the time, and the smoke was going in to the men. The foreman short-circuited the air as near the fire as he could, by opening a door. He then telephoned the fan engineer to reverse the fan. This was accomplished in a very short time and the men were then able to travel out of the mine on what was formerly the return air-course; but was now made the intake airway by the reversal of the air. There is no question in my mind but that this act saved many lives, because the fire was a stubborn one to fight.

In another case, a reversible fan, at a certain mine where a disastrous explosion took place, saved one life and allowed the rescuers to enter the mine to do rescue work shortly after the explosion took place. The fan was working as a blower, at the air shaft. The explosion blew out the steps, and slightly damaged the fan drift leading from the top of the shaft to the fan, so that it was out of the question to enter the mine by the original intake air-course. The doors were quickly changed at the fan and the air reversed, making the hoisting shaft the downcast, which made it possible for rescue parties to enter the mine by this shaft. One person was found lying at the bottom of the shaft still alive, but so nearly gone that he could not have survived very long had it not been for the reversing of the air current. I may say that all the other men in the mine were killed instantly by the force of the explosion.

The question of incompetent or excited foremen reversing the air current when this should not be done, cannot be considered as an argument against the reversible fan. The question is, if you should install a reversible fan, could life and property be better protected?

From my experience I am of the opinion that a reversible fan affords better protection to life and property than one that cannot be reversed.

F. W. CUNNINGHAM,
Inspector of 21st Bituminous District.
Charleroi, Penn.

Letter No. 14—Some time ago there was an interesting discussion in COAL AGE as to the usefulness of the "booster fan" in the ventilation of mines. Now, the question is proposed: "Should a fan be built so that the ventilating current in a mine can be reversed?" I have thought that there could be no doubt, in the minds of men connected with mining, in regard to such a question; but that if they were called upon to install a fan, they would build it so that the air current could be reversed when necessary.

It must not be forgotten, however, that the reversing of the ventilation is fraught with great danger, and more especially if the men in charge at the time are not familiar with the conditions existing in the mine. But, suppose a fire should occur at the bottom of the downcast, and the ventilation cannot be quickly reversed, what is the result? The deadly gases generated by the fire soon make the air current a DEAD LINE instead of a LIFE LINE.

An accident of this kind occurred a while ago, in Illinois, at a mine where the escape shaft was the downcast. A bale of hay caught fire and ignited the timber on the shaft bottom. The ventilation was foolishly reversed and the fire traveled through the escape shaft, burned out the buntons, partition and stairway, and went through the fan, which was of steel plate, and damaged it so badly that it was put out of commission and could not be used until repaired.

The proper thing to have done, in this case, would have been, after reversing the ventilation, to have reduced the speed of the fan and gradually close it down, as the fire, being in the shaft, would be sufficient to have made that shaft the upcast without any additional assistance.

The thought that I would impress is that when it becomes necessary to reverse the circulation, it must be done by the order of someone who has a thorough knowledge of the conditions existing in the mine. It must be understood that in accidents of this kind, it it not always best that the ventilation should be reversed; the better thing to do may be to slow or shut down the fan; or short-circuit the air at some point on the airway.

The same thing is true if the tipple should take fire, and the hoisting shaft was the downcast. By closing down the fan, in this case, the heat from the fire will generally be sufficient of itself to reverse the circulation in the mine. However, in an accident of this kind, no harm is done by reversing the circulation.

In the event of an explosion occurring in a mine, it is sometimes essential that the circulation be reversed so that rescuers can enter the mine. I have assisted in exploring mines, after explosions had taken place; and, on two occasions, the circulation of air had to be reversed, because of the damage done to one of the shafts making it unsafe for descent.

I strongly favor fans being built so that the circulation in the mine can be reversed quickly, in case of need. The cost, compared with the advantage to be gained, is not worth considering. Occasions frequently arise in mines that require the circulation to be reversed. An explosion or a fire occurring within the mine, may demand the quick reversing of the air, to secure the safety of the men. I am not in favor of reversing the circulation for other reasons, since all trap doors within the mine are generally hung so that the air pressure will keep them closed; and if the current be reversed these doors will be forced partly open, allowing the air to short-circuit, and reducing the volume of air at the working face. In a mine generating marsh gas, this might expose the men to serious danger.

If the emergency arises and it becomes necessary for the circulation to be reversed, it must be done by someone who is thoroughly acquainted with all the conditions existing in the mine, and understands the effect that will be produced by reversing the air.

JOHN DUNLOP,
State Inspector of Mines, Third District.
Peoria, Ill.

Shifting the Blame

It is a curious element of human nature to shift blame on someone else. Coal mining offers no exception to this rule. Both mine workers and mine officials, in the presence of trouble, promptly shift the blame on someone else. It is human; it begins with the school boy and clings to him as he grows to manhood. There is an all-pervading chronic reluctance to accept responsibility and blame for accident or trouble of any kind.

If it is not possible to shift the blame on the other fellow, the trouble is generally laid to some circumstance that is exaggerated and enlarged to meet the needs of the occasion. The motor failed; the track was bad; the cars not properly greased; the mule crippled; there was a fall of roof; a short-circuit on the main line; the coal-cutting machines were idle for want of bits; something wrong outside; and many other like excuses.

There are many ways of shifting the blame, but the same principle is common to all. If we fall into a hole somebody is blamed for making the hole. It does not occur to us that we should have been more observant and avoided the difficulty. An accident which, in nine cases out of ten, is the result of the victim's own carelessness, is sure to be blamed to someone else, who it is claimed neglected his duty.

Where is the mine worker or mine official who will own up to being responsible for any delay in the operation of the mine that may have resulted through his carelessness or neglect, and perhaps was the cause of the production of the mine being curtailed for weeks or months following? If you know of such a man, seek his friendship; it is worth while. The man who will honestly own his faults will never neglect a duty, betray a trust, or do any mean thing. He is a true man, and will make a good and steadfast friend.

Why should men be afraid to own up to their mistakes? We all make mistakes once in a while. It has been well said: *"The man who never made a mistake never made anything"* We may respect the man who "makes no blunders," but we cannot admire him.

Never condemn a mine worker or a mine official who makes an honest blunder, and promptly owns up to his mistake. The man who attempts to hide his mistake but is finally cornered and shown to be the guilty one, is despised by all. A mistake promptly acknowledged can generally be made right and further trouble avoided; but if the mistake is hidden, there may result a serious disaster.

In my opinion, it does not matter who makes the mistake, be he the highest official or the lowest mine worker, he should never be allowed to shift the blame on someone else. A rigid investigation should be made to ascertain the guilty party. A man who is not governed by right principles will make a poor judge of the other fellow, and is not to be trusted as a mine official. The prompt and rigid investigation of all mine matters would soon show workmen and officials, alike, that it never pays to shift a responsibility that is rightly one's own. A good weeding out should follow every such investigation; and the result would be the survival of the fittest. This would tend to encourage a good class of men, and eventually result in a saving in the cost of production of coal.

HENRY MCCLUSKEY,
Cecil, Penn. Mine Foreman.

Child Labor in Mines

The foreword, in COAL AGE, Oct. 5, voices the arguments I have put up for some years past. I have always been convinced that the mine law that forbids a boy to work in the mine before he is 16 years of age is not just or good. It places the age limit too high; it should be 14 instead of 16 years.

Miner's sons can seldom be kept in school until they reach 16 years of age. They quit school at an earlier age, and, if not allowed to go to work in the mine, they loaf. The help that parents have a right to expect from the boys is lost; and, in many cases, the boy grows up idle, assumes the rôle of dictator, refuses to work, and depends upon his parents for maintenance.

I have seen many such instances. My observation has shown me, further, that even when a boy does start to work at 16 years of age, he gives little of the money he earns to his parents, but spends it smoking or in other ways that do not improve his condition or prospects. I do not mean to say that *all* boys do this, but it is true in a majority of cases.

Again, we may ask where are we going to look for our future practical miners? The best miners today are those that started in the mines at 12 years of age. In most cases, this is the record of the best superintendents, mine foremen and firebosses, today. Moreover, the ambition of almost every parent is to have their boys look higher and obtain more congenial employment than is to be found in the mines. As a result, many boys who quit school before they are of the age that they are allowed to work in the mines, go to work at other trades, which wean them from mining.

The law setting a high-age limit for child labor in mines also works a hardship on mine foremen and superintendents, who are thus obliged to pay high wages for men to do boys' work, such as trapping, oiling cars, etc. Again I say, make the age limit for boys 14 years, and we shall have better boys and better homes.

Marion, Ill. IAGO.

The Miner's Certificate

I have been much interested and pleased with the discussions in COAL AGE; they have given me many valuable ideas. I was particularly interested in H. D. Johnson's suggestion of a method by which he thinks to secure a better and more reliable class of mines, COAL AGE, Oct. 5, p. 467.

Mr. Johnson suggests that the mine inspector should visit the working place of the miners and should, then and there, issue an inspector's certificate of competency or qualification to every miner whom he finds to be a careful workman. This suggestion is all right; but he suggests, further, that if, on another occasion, the inspector finds that a miner has been careless or has violated the rules and regulations of the mine, or the mining laws, he should revoke that miner's certificate and put him on probation.

I want to say here that the mine foreman is the responsible person in the mine, and is the one who should be rebuked for continuing employ a miner who has violated rules, regulations, or the mine law. I believe, if this were done, it would have the effect of making mine foremen more attentive to the welfare of the miners, instead of giving their whole attention to securing the "car of coal." I believe this would, also, reduce the number of mine accidents; as the mine foreman can easily correct anything wrong in a miner's place, in a short time, if he gives it his attention.

The mine foreman should examine the firebosses' reports as soon as these are made, and see that every danger reported is removed at once. When he orders a miner to do any work, in his place, that is necessary for safety and the miner neglects to do it, the mine foreman should send a company man to do the work and charge the expense to the miner. This would bring the miner to time, and make him more prompt, next time, in attending to his duties. In my experience of many years, I have found this plan to work well, and the miners seldom neglect to timber their places or take down loose rock when ordered.

I would like to make another suggestion; it is this: Let the company offer a small premium, say $10 each month, to be given to the miner who has worked every day the mine has run, and who has kept his place in the best condition. The prize winner could be decided by the mine foreman and his assistants, or by a committee chosen by the miners, their choice to be approved by the mine foreman.

I think it is important wherever foreign labor is employed in the mines, that the mine rules and regulations should be printed in every language of the men employed, so that they can understand what is required.

ROBERT GIBSON.
Acton, Ala.

Examination Questions

Selected from State Examinations, or Suggested by Correspondents

Examination Questions

(Answered by Request)

Fan Ventilation

Ques.—A mine fan is 18 ft. in diameter and makes 90 r.p.m. Assuming that the equivalent orifice of the fan is 45 sq.ft. and that of the mine, 28.5 sq.ft., what is the manometric efficiency of the fan; and what is the quantity of air this fan should deliver under the assumed conditions?

Ans.—By manometric efficiency is meant the ratio of the effective water gage or pressure to the total water gage or pressure produced by the action of the fan. The effective pressure is the pressure required to pass the air through the mine; the total pressure is the sum of the pressures required to pass the air through the fan and the mine. Since the pressure varies as the square of the velocity, and the velocity varies inversely as the orifice or area of passage, the pressure varies inversely as the square of the orifice. From this principle is developed the following formula for manometric efficiency:

$$K = \frac{100\ Of^2}{Of^2 + Om^2}$$

in which Of and Om denote the orifices of the fan and the mine, respectively.

In this case $Of = 45$, and $Om = 28.5$ sq.ft. The manometric efficiency is, therefore,

$$K = \frac{100 \times 45^2}{45^2 + 28.5^2} = 71.37 \text{ per cent.}$$

When the orifices of the mine and the fan are given and the diameter of the fan and the number of revolutions per minute are known, the quantity of air that the fan should deliver, at the given speed, may be calculated by the simple formula

$$Q = 3\ Om\ Dn \sqrt{K}$$

Substituting the given values in this formula, expressing the efficiency of the fan as a decimal, the quantity of air that the fan should produce, at this speed, is

$$Q = 3 \times 28.5 \times 18 \times 90 \sqrt{0.7137}$$
$$= 117{,}000 \text{ cu.ft. per min.}$$

Note—It is important to notice that the manometrical efficiency of a fan is true only for that given circulation. If the fan were to be located at another mine; or if the circulation, in the same mine, were to be changed by splitting the air or otherwise altering the conditions in the mine, the quantity of air produced, at the same speed of the fan, would be different, and this would change the manometric efficiency of the fan. The term, therefore, expresses the general efficiency of the circulation, as determined by the relative resistance of the mine and the fan and is true only for a given circulation.

Further, in this method of calculation, there is always the practical difficulty of determining the equivalent orifice of the fan, or the pressure absorbed in passing the air through the fan. The equivalent orifice of the mine is calcucated by substituting the values for the water gage and the quantity of air passing, as measured in the fan drift, in the following formula:

$$Om = \frac{0.00038\ Q}{\sqrt{w.g.}}$$

The same formula would suffice to calculate the equivalent orifice of the fan, if it were possible to measure the water gage due to passing the air through the fan; but this is a practical impossibility. Experiments, however, have shown that the greatest efficiency of the circulation is obtained when the equivalent orifice of the fan is from two to three times that of the mine. In the question above, the orifice of the fan is 2.5 times that of the mine.

Ques.—If 200,000 cu.ft. of air are required per minute to ventilate a mine and the pressure necessary to pass this air through the mine is 10.4 lb. per sq.ft., what size of fan will be required to produce this circulation?

Ans.—A pressure of 10.4 lb. per sq.ft. corresponds to a water gage of 2 in., and expressing the quantity of air in circulation in thousands of cubic feet, the equivalent orifice of the mine, in this case, is

$$Om = \frac{0.38 \times 200}{\sqrt{2}} = 53.74 \text{ sq ft.}$$

Now, taking the equivalent orifice of the fan Of as 2.5 times that of the mine,

$$Of = 2.3 \times 53.74 = 123.6 \text{ sq.ft.}$$

Roughly, the diameter of this fan is

$$D = \sqrt{\frac{123.6}{0.6}} = 14.3 \text{ ft.}$$

More exactly, the diameter of this fan should be 13 ft. 5 in. depth of blade, 20 in.; width, 6 ft. 6 in.

Ques.—What is the pressure corresponding to a water gage of 2.5 in. (a) expressed in pounds per square foot; (b) expressed in ounces per square inch?

Ans.—The pressure corresponding to a water gage of 2.5 in. is

(a) $2.5 \times 5.2 = 13$ lb. per sq.ft.

(b) $13 \div 9 = 1.44$ oz. per sq.in.

In other words, divide the pressure, in pounds per square foot, by 9 to obtain the corresponding pressure, in ounces per square inch.

Ques.—Describe briefly what is meant by a reversible fan, in mine ventilation, explaining the way in which its purpose is accomplished.

Ans.—A reversible fan is one that is so constructed that the direction of the air current, in the fan drift and through the mine, can be reversed by making certain changes at the fan. In the case of a disk or propeller fan, all that is necessary is to change the direction of rotation of the fan wheel and this changes the direction of the air current. A centrifugal fan always rotates in the same direction. The air enters the fan at the center and is thrown out at the circumference.

In order to reverse the air current, in this case, the fan housing must be provided with doors, by changing which the fan drift leading to the shaft or mine may be connected either with the center intake opening of the fan, or the discharge port at the circumference. At the same time, the other port must be opened to the atmosphere. By making these changes the mine air is drawn into the fan and discharged by it into the atmosphere (exhaust system) or the outside air is drawn into the fan and discharged into the mine (blowing system).

Ques.— Mention some reasons why a mine fan should be built reversible; and explain briefly some of the conditions that arise making it advisable to reverse the air current in a mine.

Ans.—A nonreversible fan limits the capacity for acting as conditions in the mine may require and curtails the efficiency of the ventilating equipment of the mine. A fire on the main intake, or an explosion in one section of a mine or seam tributary to other workings, that would shortly render impassable the only road of escape for the men, are the principal conditions that call for a reversal of the air current.

Subordinate to these are, the opportunity thus afforded of taking advantage of varying natural ventilation, in pitching seams and deep shafts; and the ability to thaw out accumulations of ice in the hoisting shaft, in winter; or to overcome a temporary annoyance or hindrance to the working of one or more sections of a mine, owing to a gob fire in another section.

Ques.—Are there any reasons why a mine fan should *not* be built reversible? If so, name them.

Ans.—Yes. Many practical mining men believe that a mine is safer when equipped and ventilated by a nonreversible fan than when the fan can be reversed, on the same ground that when there is no shotgun around there will be no accidental shooting.

Sociological Department

For the Betterment of Living Conditions in Mining Communities

Miners Baths

(Continued)

By H. F. Bulman and W. B. Wilson.

Note—For first part of article see Vol. II, p. 619-620, in issue of Nov. 2.

It was seen in the earlier article that when the hangers or suspenders, or whatever you may choose to term them, are raised to the required height above the floor, a length of chain falls to the ground and would be much in the way unless some disposal was made of it.

To obviate this, pin stands are provided which not only serve for the retention of the chains in place against the pull of the clothes but also can be used for the looping of the loose chain which would otherwise encumber the floor.

Arrangement of Clothes Hangers.

The position of the suspenders is determined by the location of the pin-stand and of the overhead pulleys. Where the racks are set against the sides of the building, with their backs, so to speak, to the wall, the pins and suspenders must all be on one side. It seems better to place them so that each stand has its range of suspenders extending from it in both directions.

The pulleys are set in the overhead joists and, in order to utilize all the room to the utmost and to increase the opportunities for ventilation, the pulleys for alternate hangers in any section are set forward or back on one or other of two joists. So that where these joists are spaced with 16-in. centers, the two rows of clothes supported from one side of any pin rack will be 16 in. apart, one hanger being on the forward and one on the rearward joist and so on. The amount of vacant space around each bundle depends upon the distances between the pulleys, and the relative height to which they are raised.

Two and Two-Thirds of A Square Foot Per Man.

In Wesphalia a fair allowance of superficial space is considered to be one square meter for every four suspenders, that is, a square measuring half a meter, or about 20 inches each way is allowed for each hanger. It should also be observed that the suspenders are not all hanging at the same level, but are raised to different heights.

In addition, there are vacant spaces around each set of suspenders, according to the position of the pin-stands, so that plenty of room is provided for currents of air to play about the clothes and dry them.

It is the rule that every man must take away his clothes at the week end. Anything that is left behind is sent to the boiler fires, and a thorough cleansing of the whole building is carried out at the close of each week. Of course, every man is permitted to take away any or all of his clothes, and bring others, whenever he likes.

Buildings Should Not Have Corners Which Cannot Be Flushed Clean.

In the design of the buildings, the chief points to be kept in mind are cleanliness, ventilation, light and spaciousness. The floor and the inside walls, to a height of 7 feet or so, should be of some material which can be easily washed clean by a douche from a hose-pipe.

Glazed bricks or tiles are to be preferred for this purpose. Crannies and corners where dirt can accumulate should be avoided as much as possible and in the upper parts of the walls there should be ample window-space for light and ventilation.

In the best designs, the roof slopes upwards from the side walls to a central raised structure of glass, with ventilators running the whole length of the building. This method of construction insures thorough ventilation and plenty of light. For artificial illumination after dark, electricity is, of course, the best means.

The finest buildings we found in Westphalia were those at the Rhein-Preussen Colliery and at New Ickern. The latter is a new operation, located not far from Dortmund and now being built on the most modern lines. A handsome bathing establishment is just completed. It provides for 2500 men and is constructed mainly of concrete. The cost for the structure alone, without fittings was $15,000.

This building and the one at Rhein-Preussen are of similar design. The water pipes and roses are placed in two side aisles or wings, running along either side and the full length of the building, each side aisle being separated from the main central portion by a wall with numerous archways. The central section is devoted to drying and dressing purposes, and contains the pin-stands and the suspenders for hanging the clothes.

Wash House at Rhein-Preussen Colliery.

The length of the building at this colliery is roughly 180 ft., and the width is about 84 ft., including the aisles, which are each about 12 ft. wide. In these side aisles are fixed 144 showers, arranged most generally in sets of eight. To each set of eight showers a foot-rest is provided about a foot in height and 6 ft. long, to assist the men in washing. This foot-rest is made of wood at Rhein-Preussen; but, at Ickern, it is made of concrete.

In the main building at Rhein-Preussen, which has an area of 10,800 sq.ft., there are 12 pin-stands, placed parallel to the width of the building, six on each side, each stand occupying a length of 24 ft. They each consist of five stout metal posts, 5 ft. high, to which are fastened metal bars about 4 in. wide, one on either side, to hold the pins. There is a lower set of bars and pins, so that the loose chain can be wrapped around the upper and lower pins instead of being allowed to hang in folds. The posts also carry projecting brackets, on which are fastened wooden planks, forming a seat on either side.

Provision for 985 Men per Shift.

We were informed that there was accommodation for 4000 men, divided among three shifts. This allows for the future development of the colliery. The total number of underground workmen employed at present is 2400, the greatest number coming out in one shift being 985, and the average daily output of coal 2000 tons. The actual time occupied in washing and dressing was about 15 to 20 min. per man, the time under the shower being not more than 10 minutes.

The building is heated with live steam by steam radiators to a temperature of about 75° F. A covered way connects the wash-house with the shaft building so that the men are not exposed to the weather, until they have washed and changed their clothes. Adjoining the bathing-hall is a waiting-room.

THE DEUTSCHER-KAISER COLLIERY

At this colliery the total accommodation provided was for 5000 men. These comprise 4300 adult miners, 250 youths, 250 surface men, and 200 officials. Separate rooms are provided for the four different grades. At present the number employed underground is 2400, and they are divided into three shifts, namely 1100 in the morning, 900 in the afternoon, and 400 in the night shift.

The showers at present provided are as follows:—For adult miners, 130; for youths, 6; and for surface-men, 12; making a total of 148. The arrangement is such that the number of showers and of suspenders can be increased to provide for a total of 5000 men, as the development of the mine progresses.

The length of the building for the underground workmen is about 294 ft., the width being about 60 ft., and the showers provided are all contained in one aisle at one side of the building, and arranged in pairs on either side of a pipe running the whole length of the structure.

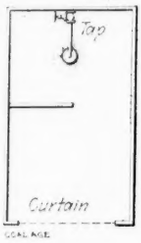

FIG. 1. MONCEAU FONTAINE WASH CABIN

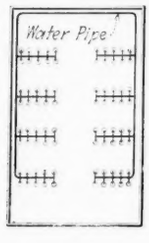

FIG. 2. GENERAL PIPING SYSTEM AT QUESNOY

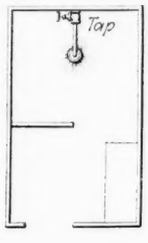

FIG. 3. CABINS AT QUESNOY BOIS DU LUC CO.

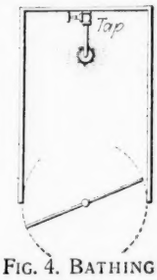

FIG. 4. BATHING CABINS AT SHAFT 13, LENS CO.

To increase the accommodation for drying and dressing, a second story, reached by a spiral staircase, has been built above the aisle where the showers are provided. The pin-stands are set lengthways along the building, and light and air are obtained through large windows in the wall opposite the washing side.

OTHER INSTALLATIONS

At another colliery in Westphalia there are similar arrangements, accommodation being provided for 2000 men in three shifts. The building measures about 132 by 51 ft., and there are 54 showers, all placed on one side; the pin-stands are set lengthways down the building.

In Belgium an excellent installation of baths is to be seen at one of the pits of the Monceau Fontaine Co., near Charleroi. Accommodation is provided for 800 men, and there are at present 102 showers, but space has been allowed for the addition of more. The building is 123 ft. long by 74 ft. in width, the height of the roof-ridge being 39 ft. In general design it is similar to that at the Rhein-Preussen and Ickern collieries, the shower aisles being built along each side of the building, but in this case each shower has its separate cabin. The aisles each occupy a width of 16½ feet, leaving a central area 41 ft. wide and 123 ft. long (5043 sq.ft.), which is used for dressing purposes and for hanging up clothes. Metal boxes as described in the previous article are provided to hold the slack of the suspender chains.

SEPARATE CABINS FOR EACH BATHER

The cabins (Fig. 1), built of glazed bricks, are 39½ in. wide by 5 ft. 4 in. long. They are provided with a little outer compartment containing two or three hooks and a seat. Openings in the walls, about one foot high, are left next to the floor, which allow the water to run away, and also permit of freer ventilation.

All joints are made with a bevel, so as to avoid any sharp angles where dirt may accumulate. A stout canvas curtain hung from an overhead rail can be drawn across the entrance to each cabin. The total first-cost of this establishment was stated to have been $23,160, or $28.95 per suspender. It is an unusually spacious and handsome installation.

BATHHOUSE AND DRYHOUSE SEPARATE

At the Quesnoy Shaft of the Bois du Luc Co., Belgium, the bathing installation comprises two separate buildings, one for washing and the other for dressing, communicating with each other by a short passage. About 500 men are at present using the establishment, and the bathing-hall is 69 ft. long, 46 ft. wide, and 23 ft. high.

There are eight showers, arranged in sets of ten, from eight branch-pipes (Fig. 2), each pipe being about 15 ft. in length, and carried out from the side walls in a direction parallel to the width of the building. From the branch-pipe five short pipes, each about 2 ft. in length, project at right-angles on either side, terminating in the roses for showers.

The eighty cabins (Fig. 3) are made of painted sheet-iron, and are grouped in sets of ten, one to each shower.

The dressing-hall is 75 ft. long, 46 ft. wide, and 41 ft. high. The suspender-pins are fixed along the side walls, and it is estimated that there is room for 1000 hangers. Twelve wooden benches are arranged about the hall.

COST OF BATHHOUSE TWENTY DOLLARS PER MAN

M. Kuss gives the cost of this installation as follows: *

	Dressing-hall	Washing-hall	Total
Ground	$344.50	$340.65	$685.15
Buildings ..	5,018.00	4,940.80	9,958.80
Fittings ...	1,366.05	3,386.76	4,752.81
Totals ...	$6,728.55	$8,668.21	$15,396.76

This total sum of $15,396.76 is the first cost of this installation of 80 showers and 800 suspenders, equal to about $20 per suspender or man using the baths. M. Kuss considers that $20 to $23 per suspender is the average cost of important and recent Belgian installations.

At one of the most modern collieries (Shaft No. 13 of the Lens Co., Pas-de-Calais) a bathhouse has been recently installed. It is a fine brick building, well lighted and ventilated by large glass windows which run continuously along its two sides in the upper half of the walls. It is 78.7 ft. long, 36 ft. wide, and 21 ft. high to the top of the walls, the total height to the roof-ridge being 33 ft.

THE ADVANTAGES OF THE REVOLVING DOOR

The building provides for 650 men in two shifts; there are 650 suspenders and 56 showers; the latter are placed around the walls of the building, with a separate cabin for each shower.

The cabins of white glazed bricks (Fig. 4) are 39½ inches wide, 5 feet long, and 6¼ feet high, with no separate compartment. The entrance to each cabin is provided with a wooden door, arranged so as to turn easily around its central axis on pivots fixed above and below. To one side of the door are fixed four hooks on which the clothes can be hung. By revolving the door the clothes can be removed from the room and there is then no risk that they will become wet while the bather is washing, and he can revolve the door when he wants to obtain them.

The central portion of the building is used for changing the upper garments, and for keeping and drying the clothes which are left by the workmen.

It is evident that the number of showers provided must depend upon the largest number of men coming out in one

*"Note sur les Installations de Bains-douches pour les Ouvriers Mineurs, en Belgique," by M. Kuss, Annales des Mines, Paris, 1911, vol. xix, page 5.

shift, and on the time which they take to come out, as a man cannot be expected to wait for his bath very long. The number of suspenders must equal the total number of men using the establishment.

Labor in Adolescence

By J. H. VAUGHAN*

Unfortunately, I cannot agree with some statements in your able foreword of Oct. 5. I take exception particularly to the criticism of the forms of amusement adopted by the jobless boys. Smashing windows is a juvenile amusement not indigenous to the coal fields. It is indulged in by boys of every nationality, caste and occupation, and I must confess that even today it warms the cockles of my heart to see a brick hurled with precision through a plate of glass.

Hypothecating mules from the company stables is not so much a reflection on the misguided propensities of boys as it is on the form of management that makes it possible. And as for wilfully or maliciously experimenting with the destructive properties of dynamite and black powder, this, to me, is inconceivable. No doubt there are isolated instances where boys have procured and experimented with these destructive agents, but I hardly believe that the author of your foreword intends us to infer that it is an occurrence of any frequency.

Boys in the adolescent stage are naturally curious and prone to tamper with anything containing an element of mystery or excitement. The pernicious practice, if it may be called a practice, of tampering with explosives, is to be condemned more for the laxity which makes it possible than because of the boyish inclination thus asserting itself.

CHILD LABOR AND BIRTH RATE

While I have no data to support me, I am inclined to question the reliability of the finding of Mr. Pearson that child labor legislation has any appreciable effect on the birth rate. The observation is made that "few parents are disposed to assume a greater responsibility than that with which they are already weighed down, if their children cannot be made to bear a part of that burden."

I submit that the possible productivity of children is not a prenatal consideration with normal parents. This is particularly true of the illiterate types in the coal fields where copulation is an expression of pure animalism, and the resulting birth is accepted as a very natural sequence. The parental affection for children in these districts is primitive, and in the very nature of things devoid of the little refinements observable in the higher orders of society. Nevertheless, it is sincere.

And it is only with the realization that another responsibility has been imposed on the household that the economic consideration of assuming a part of the burden thus imposed obtrudes itself. This, too, is taken to be inevitable, and seldom plays a part in any succeeding birth.

Eugenics and political economy may some day correct this condition, but while it exists we must have child labor laws to establish age limitations and define the hours and character of this labor. The present demand for legislation on this subject is directly traceable to the abuses of the system arising from the cupidity or necessity of parents and the indifference of the much-abused, much-misrepresented and machiavelian "coal baron." It is the duty of the state to protect children against both.

[Our critic says that the laxity which permits boys to obtain explosives is more pernicious even than their use of them. The miners frequently take explosives home, this being only natural seeing that they belong to them and that they are not allowed to take large quantities into the mine. Thus the obtaining of explosives by boys is comparatively easy and can only be met by the operator or some other authority taking care of broken packages.

Mr. Vaughan also ventures to doubt Karl Pearson's figures. The information of that authority on eugenics and heredity is derived from British experience. The laws of Great Britain in reference to the registration of births are most stringent and are unfalteringly observed. It was found that whenever a new and more stringent child-labor law was passed, a lowered birth rate was apparent. To doubt the facts despite the evidence presented, is impossible.

Mr. Vaughan quotes the foreword and then misrepresents it. We are sure that his misrepresentation is unintentional, however. He strains the meaning of the foreword and makes it state that the "possible productivity of children is not a prenatal consideration." The foreword does not allege that it is. The quoted statement means rather that parents often decide at any moment when the matter is under discussion that as they are deprived of the help of their adolescent children, they do not have the needed money to support any more just at that time.

And, moreover, being deprived of the immediate income of possible earning children, they cannot meet the expenditures of the accompanying maternity. They are not considering the future earnings of unborn children, but the present cost of living and the present income. We agree with Mr. Vaughan that they do not often look far ahead.

But he will still declare that the writer of the foreword is wrong. Mr. Vaughan has the outsider's view of the mining population, and it is not too favorable. He believes that no consideration influences the birth rate, which responds solely to the demands of animalism. If he thinks that this is true of the Southern Europeans in mining camps, he must remember that these men are largely unmarried and chaste. Consequently their attitude is not in question. The American and British miners are just as likely to be influenced by economic considerations as are other Americans and British people, and as are the inhabitants of France. No argument is necessary to show that the birth rate in all these three countries is decreasing.

We could not hope to meet and confute all the objections which Mr. Vaughan would raise to adolescent labor, unless we devoted to that subject the contents of a special number. We therefore limit our answer to matters of fact covered by his criticism and do not endeavor to meet his variant opinion. —EDITOR.]

*799 Eighth Ave., New York City.

Tennessee Intercompany First Aid Meet

The first-aid field day exercises held in Knoxville, Tenn., on Saturday, Oct. 26, under the auspices of the Society of Tennessee Mine Foremen, attracted several hundred miners and many of the members of the Southern Appalachian Coal Operators' Association from the Tennessee and Kentucky fields.

The morning exercises were held at the Bijou theatre and opened at 9 o'clock, continuing until noon. E. F. Buffat, grand foreman of the Society of Tennessee Mine Foremen, presided, and after making a short address, introduced Judge J. H. Wallace of Clinton who made an address of welcome.

R. P. Jarvis of the University of Tennessee then made some remarks concerning the qualifications for mine foremen. He recommended the technical training of all men employed in that capacity.

Congressman R. W. Austin, Geo. E. Sylvester, state mine inspector, and J. J. Rutledge of the federal bureau of mines, also made addresses. Dr. Rutledge used for his theme: "Unnecessary Shots and the Dangers to which Miners Are Subjected." He used a chart, demonstrating the methods of blasting coal in mines of all classes. He demonstrated the bad results from the over-use of black powder.

Edgar B. Sutton, who has charge of the local mine rescue station, was the next speaker and A. H. Purdue, State Geologist, followed.

At the conclusion of the exercises at the Bijou, the visitors dined and went to the baseball grounds at Chilhowee Park,

where the first-aid-to-the-injured demonstration was given. Ten teams from the Tennessee and Kentucky fields took part.

These competed in five contests, demonstrating mine-rescue work. The manner of caring for fractures and other injuries was exhibited. The rescue corps then gave a demonstration of the use of the pulmotor and oxygen helmets. There was also a contest between the trapper boys and the operators.

RATING OF FIRST AID TEAMS

Tm No.	Capt.	Company	Per-ct.	Prize
7	W. M. Mills	Roane Iron Co.	98⅛	Silver cup and $25.00
2	R. Rigby	Campbell C. M. Co. Jackson Mine	97⅞	30.00
1	J. E. Hendren	Black Diamond C. Co.	96⅞	18.00
9	Ed. Wilkes	Pless Coal Co.	96	15.00
10	R. L. Hicks	Red Ash Coal Co.	96	10.00
3	Geo. Vinsant	Campbell C. M. Co. Westbourne Mine	95⅝	5.00
4	Ed. Martin	Coal Creek M. & M. Co.	95⅜	
11	Roy Reddie	Graselli Chem. Co.	94⅝	
12	G. B. Carden	Piedmont Coal Co.	93⅝	
8	J. M. Woods	Knoxville Iron Co.	93⅜	
6	H. H. Braden	Tennessee C. I. & R.R. Co.	92⅛	
5	H. G. McDonal	LaFollette C. I. and Ry. Co.	90⅛	

The Southern Appalachian Coal Operators' association gave an aggregate of $150 in prizes. Of this $78.00 represents the award above detailed with the exception of the $25.00 given the winners of this first prize. The other $72.00 was expended by giving a dollar to each contestant in the events. The cash prize to the winning team was presented by R. W. Austin, the representative of the district in Congress. The Draeger Oxygen Apparatus Co. donated an electric lamp to the winner of the one-man event.

Almost all of the mines in the Jellico and Coal Creek districts suspended operations yesterday to allow the miners to come to the city for the exercises. A special train was run over the Louisville and Nashville railroad from Fonde to Knoxville.

Nanticoke Mining Institute

By E. E. Lee*

The winter lectures of the Nanticoke Mining Institute opened on Saturday evening, Oct. 19, in the auditorium of the Susquehanna Coal Co.'s office building. Judging from the interest displayed, these affairs promise to be attended with a greater degree of success this season than ever before.

President William H. Morgan,, in his opening speech, referred to the work done by the institute in the past, and predicted for it a brilliant future. He told the men that the Nanticoke School Board was about to start night classes in mining, this move being made possible by the new School Code of Pennsylvania. He asked them to avail themselves of such a splendid opportunity for receiving a mining education.

The speaker of the evening was Superintendent Harry G. Davis, of the Coal Mining Department, Delaware, Lackawanna & Western R.R., who gave an address on accidents, and the suffering and losses sustained thereby. The lecture was illustrated with pictures taken from the book on accidents, issued by the Delaware, Lackawanna & Western Coal Department.

*Engineering Dept., Lehigh Valley Coal Co., Wilkes-Barre, Penn.

The Panther Valley Mining Institute

By A. T. Shurick

The first business meeting of the new Panther Valley Mining Institute was called to order at 7:45 p.m. Saturday evening Nov. 2 at Lansford, Penn. President W. G. Whilden presided and after a few preliminary remarks followed by the institute song, the routine business of the society was taken up. The secretary's report showed an enrollment of 412 members of whom 142 were present.

The first paper of the evening, entitled "Preparation of Anthracite," was written by S. V. Tench, outside-superintendent of the Lehigh Coal & Navigation Co. The article was read by A. R. Henley, in the absence of Mr. Tench, and presented a number of unique and valuable features on this important subject. Vice-president Edwin Ludlow of the L. C. & N. Co., in discussion, remarked that it was well for us to look into the future and consider whether there was not a possibility of our successors working over the old culm piles which are accumulating today, even as we are now working over those of our predecessors. He also stated that he believed the large percentage of the finer sizes was largely due to the indifference of the man at the working face.

He quite pertinently reminded the audience that the larger proportion of new inventions originated in the ranks of the practical men, as an example of which he cited the case of one Jimmy Kattigan to whom, he stated, the credit for the present Dodge system of aërial trams was due. He took occasion at this point to remark that it was one of the purposes of the Panther Valley Mining Institute to see that credit for such developments be rightly bestowed in the future.

C. Dorrance, fuel engineer of the L. C. & N. Co. stated that an increase of 1 per cent. in the steam sizes meant an annual saving of $75,000 to the company. Also that during the past five years they had increased the percentage of prepared sizes 40 per cent.

The second paper of the evening was entitled "Increasing the Efficiency of Electric Mine Haulage by Utilizing Discarded Hoisting Ropes." It was written by Albert Loonars and read by G. M. Hines. E. J. Jones, assistant inside foreman, in discussion stated that, in his mine where this system had been applied, the capacity of the locomotives was increased four fold. Quite an animated discussion was aroused as to just who should be held responsible for inspecting and maintaining the bonds in the track on electric haulage roads.

The third and concluding paper was presented by James G. Jones, and was entitled "A Novel First Aid Splint." The article was accompanied by a practical and instructive demonstration of the advantage of the device.

Mr. Ludlow was then called upon for a few remarks and began by complaining that on the occasion of the Institute banquet some time previous he had been asked to prepare a speech which he had not been allowed to make. When asked if he proposed imposing a secondhand speech on the present audience, he disclaimed any such subterfuge and admitted that the previous talk had been inspired by the croquettes at the banquet. President Whilden agreed that the croquettes had resulted in a good movement on the part of the Institute.

Mr. Ludlow then gave a brief talk on the night school which the company is forming to assist the men in acquiring sufficient technical training to qualify for foreman and firebosses. He stated that free instruction would be provided and all that the students would have to purchase would be a few special instruction books which would be provided at cost. W. B. Richards, of the company's engineering department, will be in charge of the school; 46 members were enrolled at the close of the meeting.

Among those present were: Edwin Ludlow, vice-president of the L. C. & N. Co.; J. T. Gilbert, paymaster, J. V. Lyddon, superintendent of railroad; Dr. J. H. Young, company surgeon; H. M. Crankshaw, E. J. Jones, T. J. Jenkins, M. O. Morgan, division superintendents; C. Dorrance, fuel engineer and J. M. Davis, mine inspector of District No. 17.

Note: All the papers presented at this meeting will be run in whole or part by Coal Age.

Winter Meeting of W. Va. Coal Mining Institute

The West Virginia Mining Institute will hold its winter meeting at Parkersburg, W. Va., on Dec. 10 and 11. New officers are to be elected and a vote taken on changing the constitution to provide for one meeting a year instead of two.

The program and further details will be forthcoming in about three weeks.

Coal and Coke News

From Our Own Representatives in Various Important Mining Centers

Washington, D. C.

The striking development of the week past in the work of the government as affecting the coal situation has been the investigation of the Interstate Commerce Commission with respect to the question of car shortage. This subject is considered to have a general application, but special significance is attached to the coal side of it, and most of the work done by the commission thus far has related to the coal question.

The railroads probably started the commission into activity in the first instance about a month ago by their statements that they had been unable to provide all the equipment that was needed because of the lowness of rates which compelled them to economize and prevented the purchase of new cars and other facilities. The Commission interpreted this as a reflection upon its policy of keeping rates down and refusing advances. That, indeed, was stated in so many words in many quarters, the plain assertion being made that, had it not been for the methods of the Commission, there would not have been so much of a reduction in the purchase of equipment, but the roads would have kept themselves furnished.

The charges thus made took hold of the country to such an extent that the Commission felt itself obliged to do something to offset it, and hence began an inquiry whose results were announced in advance, as was pointed out in these columns at the time. The object of this inquiry was to show that the whole trouble was due to the failure of the railways to move cars fast enough, allowing shippers instead to use the cars as storage places and to the inadequate control of supply and distribution of cars by demurrage rules that were unsatisfactory.

As time has gone on, the agents of the Commission have uncovered more or less that is unsatisfactory in the demurrage situation, and on Saturday, Nov. 2, the Commission felt itself sufficiently fortified with details to make public a statement charging the roads with inadequate precautions. This statement is likely to constitute the basis of a long controversy before Congress during the coming winter.

Those railroad men who have feared that the Commission would "come back at" them with a reply of some kind in retribution for the criticisms of the Commission that have been made in railroad quarters, now hold themselves to be justified by the statements issued by the Commission and by the fact that this organization has announced that it will in future consider, in all cases where it seems to be established that cars are being held for storage purposes, the issuance of a rule containing the following provisions:

1. That a higher per diem rate shall be made to apply for the use of cars as between the carriers.
2. That an inspection service be at once instituted which shall report to this commission violations of the rules existing, which are intended to insure the return of equipment to the home line.
3. That operating officials be instructed to make fuller use of locomotives and cars by increasing the speed of freight trains. An average movement of less than 25 miles a car a day is not adequate to the need of a time such as this. An increased speed of movement is tantamount to an increase in equipment.

It is probable that in the annual report of the Commission this subject will be dealt with exhaustively and that a demand will be made for legislation calculated to rectify the bad conditions alleged to exist in regard to demurrage. There seems to be a feeling that now is the time to get legal sanction for some of the demurrage schemes that the Commission has long advocated, but for which it has never been able to get complete congressional approval.

Pennsylvania

Anthracite

Hazleton—The miners throughout the anthracite coal region held their annual celebration of John Mitchell Day, on Oct. 29. Business was suspended and many mass meetings were held in commemoration of the successful termination of the 1900 strike of the anthracite men under the direction of John Mitchell, at that time president of the United Mine Workers.

Harrisburg—The investigation of the Philadelphia coal rates by the State Railroad Commission will begin in Harrisburg, Nov. 18.

The place where the hearings will be held has not yet been selected, but the probability is that one of the rooms in the city hall will be engaged for the purpose.

Luzerne—A mine cave over the workings of the Raub Coal Co., at Luzerne, came near causing a serious wreck on the Bowmans Creek branch of the Lehigh Valley R.R., on the first of this month. A loaded coal car in the middle of a train, dropped into the cave.

Throop—The employees of the Pancoast colliery, of the Scranton Coal Co., located at Throop, Penn., went out on strike early in the week. The contract miners at the colliery claim that they are compelled to take down top rock without any compensation. A committee of the strikers has been appointed to confer with the officials in an effort to settle the trouble.

Wilkes-Barre—The second meeting of the Wilkes-Barre District Mining Institute will be held on Saturday, Nov. 9. The speaker of the evening will be Supt. H. G. Davis, of the D. L. & W. coal department, who will give an illustrated talk on the conservation of the mine workers.

Bituminous

Pittsburgh—What was probably the first prosecution for violation of the state mining law for using slack coal for tamping purposes, was brought, Oct. 26, by State Mine Inspector John I. Pratt, against Samuel Moran.

The miner was accused of using combustible material for tamping. He admitted the charge and, on request, the case was dismissed. Moran said he would pay the cost and that he did not know he was violating a state law.

Greensburg—Constable C. H. Cooke, of the Osborne Coal Co., is endeavoring to break up the practice of transferring the coal of one digger to the credit of another by replacing the real digger's check *en route* from the mine to the pit mouth by a false one.

Mr. Cooke has arrested several miners for this offense, and they have refunded to the rightful diggers their pay and settled the cost of prosecution.

Latrobe—Two miners were killed and two injured, Nov. 1, by a fall of slate in the Superior mine No. 2, of the Latrobe & Connellsville Coal & Coke Co. The four men were at work in one room when nearly two tons of slate fell on them.

Connellsville—Mine-safety car No. 6, of the U. S. Bureau of Mines, in charge of Mine Foreman B. D. Davis, and a crew of expert miners, is in the Cambria County field this week.

This car is one of eight that constitute the life-saving service of the Bureau of Mines.

Butler—J. D. Stoops has instituted equity proceedings against M. C. Egbert and others, asking that the defendant be enjoined from operating a coal lease in Fairview Township.

Charleroi—Scarcely a coal mine along the Monongahela River has enough miners, and it is said there is employment for at least 1000 more men.

West Virginia

Charleston—Several hundred coal miners started a new strike in the West Virginia field, Oct. 25, when they refused to work for the Solvery Collieries Co., Kingston, where the basis of payment was changed from yardage to tonnage.

It is reported a settlement has been reached at Dorothy, and that 400 or 500, who have been living in shacks, are returning to company homes, now equipped with electric light, bathrooms and other sanitary improvements.

Maryland

Baltimore—It is understood that the new coal rates to be established by the New York Central R.R. and the Western Maryland Ry. Co., from the Pittsburgh district to tidewater, went into effect Nov. 7. Under this rate, which will be the same as that from the Fairmont region of West Virginia to Baltimore, it is expected that a large tonnage of gas coal originating at the mines located on the West Side Belt R.R. will move through Baltimore.

Cumberland—Every mine in the Georges Creek coal region is busy, and it is stated by operators that 500 more men are needed. One mine of the Consolidation Co. alone is shipping 1000 tons per day. This is the old Borden shaft mine, which has been closed for 20 years, on account of water, and which recently was drained.

Alabama

Blocton—The first report of the fire in mine No. 2 of the Tennessee Coal & Iron Co. has been greatly exaggerated. The fire was soon under control and work was never abandoned. The men overcome by the whitedamp have fully recovered. Work in the mine is going on as usual.

Tennessee

Knoxville—Hundreds of mine foremen and miners of the Tennessee-Kentucky coal field, recently participated in the exercises of the first annual field day of the Tennessee Society of Mine Foremen.

Kentucky

Central City—The United States Bureau of Mines Safety Car No. 3, which has been touring the mining districts of the Southeast, was scheduled to be at Central City, Ky., Nov. 3, in charge of Mine Foreman Jesse Henson and a crew of experts, who demonstrate at the various stops the latest safety devices for use in coal mines.

Whitesburg—Whitesburg, one of the leading towns in the Eastern Kentucky coal fields, has been devastated by a fire which caused a loss in the business district of about $20,000. Only the efforts of practically the entire population prevented the fire from destroying the entire town.

Louisville—Commissioner of Agriculture J. W. Newman will send a labor inspector to investigate a charge that children under the age of 14 are employed in the mines of eastern Kentucky, contrary to the provisions of the Kentucky statute on the subject. Violations of this sort are said to have been committed in Bell County, from which vicinity a complaint was received which caused the commissioner's action.

Lexington—Fire, started by sparks from a locomotive, practically wiped out the town of Helier, Pike County, a new town established by the companies operating coal mines there.

Ohio

Columbus—Shortage of cars is the main agency that is preventing the coal mines in Ohio from operating full time at present, according to President John Moore, of the Ohio miners. All of the mines are working part time, he says, and the majority of them would be working full time if the railroad companies could furnish sufficient cars to move the coal.

St. Clairsville—The Stewardville mine, of the Franklin Coal Co., resumed operations, Oct. 29, after a shut-down of 2½ months, on account of a strike, which was due to the discharge of two men.

One hundred and twenty-five men are affected. For the first time in five years there are now no strikes in subdistrict No. 5, United Mine Workers of America, where over 17,000 men are employed.

Indiana

Vincennes—The Indian Creek Mining Co., of Knox County, is said to be making rapid improvements toward increasing its output. In addition to completing one new shaft, it is starting on the construction of another which is expected to increase the present output at least 50 per cent.

Terre Haute—The Corn, Coal and Industrial Exposition, recently held in Terre Haute, was a surprising success. The various coal exhibits and the demonstrations of the Mine Rescue Car daily attracted large crowds.

Illinois

Seneca—J. L. Jones, president and principal owner of the Wilfred Coal Co., is suing the Ottawa *Republican Times* for $20,000 libel because of a number of alleged mis-statements which were recently published and were calculated to injure the business and reputation of the company.

The *Republican-Times*, under the date of July 15, claims that the mine had been closed and that the men had not been paid. Mr. Jones claims, on the contrary, that the mine has not been closed; that it is in full operation, and that he had no trouble with the employees.

Taylorville—Four hundred miners returned to work Oct. 25, following the settlement of a strike which originated in the refusal of the mine owners to equip the cage which the miners rode with certain safety appliances. These appliances will soon be installed.

Centralia—A meeting of the coal operators and representatives of the miners of this mining group, comprising several counties in this part of the state, was held at the Pittenger Hotel Club, Oct. 24. The object of the meeting was to consider pending controversies between the men and the operators at the various points and effect a settlement.

Galesburg—Pendergast Brothers' coal mine, at Seperville, the largest of the 23 mines in Knox County, was destroyed by fire, Oct. 2, all the buildings being burned to the ground and the shafts caving in. The cause of the fire has not been determined.

Kansas

Pittsburg—Two men were killed and another severely injured in an explosion at mine No. 3 of the Mayer Coal Co., Oct. 25. The explosion is said to have been caused by a windy shot.

Arizona

Prescott—Of the 19 Prescott locaters of coal land in Navajo County, all except four or five have received notifications from the U. S. Land Office that patents will be issued to them. Small technicalities in the matter of making proof have delayed the applications of a few who have not been notified.

Colorado

Fort Collins—The City Council has instructed a committee to file, in the name of the city, upon 600 acres of coal lands, lying about 18 miles north of here.

The action was taken in anticipation of the next Congress passing a bill granting city government limited acreage of coal land from the public domain. The coal will be used for municipal purposes. There is a bed 10 ft. thick underlying the tracts, and it is said to be of high quality.

Denver—Interest has almost entirely died out in the stock of the Colorado Iron & Fuel Co., which was so conspicuous last month. The speculative value of developments at the annual meeting did not pan out, and, although the company is making large earnings and showing a big surplus, it is apparently not disposed to do anything yet for its stockholders.

Foreign News

Punta Arenas, Chile—It is reported here that Germany is about to acquire an island in the Magellan Channels to be

used as a coaling station. The German cruiser "Bremen" is now engaged in exploring and surveying in the vicinity, and it is understood that the visit also is connected with the opening of the Panama Canal and the possibilities for German trade in South America.

Toronto, Ont.—From a test well drilled down 107 ft. 2 in. on the L. H. Hilsinger holdings, west of Saltsman's Grove, it develops that a fine 5-ft. 4-in. vein of coal underlies the property. It is the intention of interested parties to open up a mine.

Personals

M. M. Bardwell, an officer of the North Jellico Coal Co., of Louisville, Ky., remains extremely ill from some disease or combination of diseases which has for five months failed to yield to the numerous treatments which have been prescribed.

Robert M. Black, formerly mining engineer with the New River & Pocahontas Consolidated Coal Co., in West Virginia, and other companies in Illinois and Oklahoma, has been appointed assistant professor of mining in the University of Pittsburgh.

A. R. Henley has been promoted to fill the vacancy of chief mechanical draftsman of the Lehigh Coal & Navigation Co., Lansford, Penn. Mr. Kudlich, who formerly held the position, has resigned to accept a position with the Federal Bureau of Mines.

J. M. Webb, formerly of Urbana, Ill., who was designated by the U. S. Department of Mining as temporary manager of the Government Mine Rescue Station at West End, Birmingham, Ala., will probably be placed in permanent charge of that station. Several days ago the government offered Mr. Webb either the West End Station or the one at Duluth, Minn. Mr. Webb has expressed a preference for Birmingham, and if placed in permanent charge of the station, will remove his family to that city.

Obituary

Isaac S. Roberts died, Oct. 28, at his home, 24 Gates Ave., Montclair, N. J., after an illness of pneumonia, at the age of 63 years. Mr. Roberts was formerly secretary of the S. S. Middleton Coal Co. Funeral services were held Oct. 29, and the burial took place in Lambertville, Oct. 31.

Former State Senator F. M. Hutcheson, Sr., aged 64, the author of the Kentucky law requiring the payment of coal miners every two weeks, died Oct. 30, at his home at Henderson, Ky., after an illness of six weeks. Mr. Hutcheson was a lawyer, and served in the Kentucky Legislature during its long session in 1891, 1892 and 1893, during which time he was instrumental in securing the passage of the law referred to. He is survived by his wife and four children.

Publications Received

Report of the Department of Mines of Pennsylvania, Part 1—Anthracite. Book of 672 pages, 6¼x9¼, covers in detail the operations in twenty-one anthracite districts.

Construction News

Glen Campbell, Penn.—The Clark Bros. Coal Co. is preparing to open a new mine near this city.

Columbus, Ohio—The Norfolk & Western R.R. plans to make large additions to its coal terminal facilities at this city. It has purchased 100 acres on the outskirts of the town and prepared to begin work this fall on extensive improvements.

Palos, Ala.—The Republic Iron & Steel Co. is preparing to expend approximately $100,000 in making extensive improvements at its Sayre and Palos mines. New washers are to be installed at both plants. The machinery is expected to cost from $45,000 to $50,000 at each mine.

Adrian, Mich.—Officials of the Wabash R.R. announce that the company will erect a coaling dock in this city. The plan to discontinue the use of the coal docks at Milan seems advisable. Work also is being done on the second track of the road between here and Detroit, forming a double track into that city.

Chattanooga, Tenn.—The Harriman Coal Co. is making extensive improvements on the Little Emory coal mine. The mine has been equipped with electric machinery and the output increased to 500 tons per day. It is expected that operations will be resumed within a short time. This mine is owned by Chattanooga men.

Rogers, Ohio—Workmen began the task of erecting the power house of the Quaker Valley mine, Oct. 29. The building will be of substantial construction and contain two electric generators for the purpose of furnishing electrical power for the mining machines and trolley motors. A movement is on foot to have the streets of the village lighted by electrical current from the mine.

Mulga, Ala.—The Woodward Iron Co., at their coal mine at Mulga, recently acquired with the other property of the Birmingham Coal & Iron Co., are sinking a rock slope to the mine in the Pratt Seam of coal to be used as a manway and for the purpose of taking in material. The slope is on a 50-degree pitch and will be about 435 ft. long, the coal at that point being about 300 ft. deep. The slope will be 12 ft. wide and 7 ft. high, and will have a track on one side and concrete steps on the other.

Jamestown, N. D.—The construction of an immense new coal dock for the Northern Pacific R.R. Co., at Jamestown, has commenced, and the structure when completed will be one of the largest and most modern of those along the main line of the road. This will have a capacity of 450 tons, and instead of elevating the coal to the bins by buckets upon endless chains, the coal cars themselves will be pulled up an incline plane and then unloaded directly into the bins. The new docks will be of standard design, serving two tracks, three chutes on a side. The contract for the structure has been let to Libbey & Nelson, of Minneapolis.

Portland, Ore.—Coal will soon come into the Portland market from the mine of the Sheldon Coal Co., at Chehalis. This company has just been organized with W. D. Sheldon, Ben Sheldon and W. F. West as the leading stockholders. The Sheldons have been working the mine on Coal Creek, about three miles from Chehalis, for some time, but its capacity will now be increased from 60 tons a day to 100, and it is expected next year to double this amount. The increased output will make it possible to extend the market to Portland. The mine will also have better transportation facilities in the near future, so it is reported.

Louisville, Ky.—The opening up of another extensive coal field in Harlan County is planned in connection with the building of an eight-mile branch of the Wasioto and Black Mountain R.R., by the Louisville & Nashville R.R. Representatives of the railway company are now securing rights of way up Martin's fork from Harlan. T. J. Asher, of Wasioto, and Judge W. F. Hall, of Harlan, who own large tracts of coal and timber lands in the Martin's fork section, are said to have interested the Louisville & Nashville in the building of the branch.

Judge Hall and Mr. Asher are preparing to have a number of mining plants in operation by the time the line is completed.

Kittanning, Penn.—The Allegheny River Mining Co. has completed and placed in operation its new plant at Hunt's Run, Jefferson County, Penn., on the Pittsburgh & Shawmut R.R. The plant is designed for rope haulage, and is equipped with automatic car haul. The tipple is designed for a capacity of 1000 tons per day, opening a field of about 3500 acres.

Work on the new plant of the same company now being erected at Furnace Run, near Kittanning, Armstrong County, Penn., also on the Pittsburgh & Shawmut R.R., is progressing rapidly. The power house, of steel and Hy-Rib construction, is now in course of erection, and much of the machinery is delivered on the ground. This plant will be a central power station for developing an adjacent field in Limestone Run. There is tributary to this, and owned by the Allegheny River Mining Co., about 8000 acres of coal.

New Incorporations

Gilman, Mo.—The Gilman Black Diamond Coal Co. has been incorporated, capitalized at $2800 in this city.

Manchester, Ky.—The Manchester Coal & Coke Co., Manchester, Ky., has been incorporated with $50,000 capital.

Austin, Tex.—The Dow Coal Co., of Houston, has filed amendments, increasing capital from $150,000 to $200,000.

Clearfield, Penn.—The Moshannon Coal Mining Co., Clearfield, Penn., has filed notice of increase of debt to the extent of $100,000.

New York City—Archer Coal Depot Co., Inc., Manhattan, N. Y. Conduct mining operations. Capital, $100,000. Incorporators are E. C. Rieger, B. J. Wright, H. B. Possom, New York City.

Los Angeles, Calif.—California Fuel Manufacturing Co., capital stock, $500,000; subscribed, $5000. Directors: A. R. England, F. A. Allen, E. G. Murray, Hiram Foremen, J. M. Shaw.

Valparaiso, Ind.—The McFetrich Lumber & Coal Co. has been incorporated at Valparaiso, Ind., with $10,000 capital stock, as retailers. The directors are Gus Jones, Mandel Lowenstine and Abe Lowenstine.

Hobart, Ind.—The Peirce-Walker Lumber & Coal Co. has been incorporated at Hobart, Ind., with $10,000 capital stock. The directors are Charles S. Peirce, Valparaiso; Loring H. Peirce and Elbridge G. Walker, Hobart.

Portland, Maine—Cross Creek Coal Lands & Lumber Co., Portland, Me. Deal in coal and lumber properties in Tennessee or elsewhere. Capital, $250,000. President, M. S. Newcomb; treasurer, E. V. Mann, Portland, Maine.

Ravenna, N. Y.—The Montross and Bush Co., of Ravenna, with a capital of $5000 to deal in coal, coke and wood, was incorporated, Oct. 23. The directors are Sarah J. Montross, Arthur U. Montross and Fred C. Bush, all of Ravenna.

Richmond, Va.—Interior Mining Co., Inc., Roanoke, Va. Capital, maximum, $40,000; minimum, $300. Geo. F. Eldridge, president, New Rochelle, N. Y. Edward Mullan, secretary and treasurer, Westwood, N. J. Jno. F. Desmond, Brooklyn, N. Y.

Philadelphia, Penn.—A merger of eleven retail coal companies owning 30 yards in various sections of Philadelphia and controlling more than half of the retail trade has become effective. The new company is capitalized at $6,920,000 and will operate under the name of Geo. G. Newton & Co.

Greensburg, Penn.—Notice has been given that an application will be made to the governor of Pennsylvania, Nov. 28, for a charter of an intended corporation to be called the Penn-Westmoreland Coal Co., whose object and purpose is the mining, shipping and selling of coal and coke, and the products thereof, to such persons, partnerships, firms and corporations as may desire the same.

Pittsburgh, Penn.—Notice has been given that an application will be made to the governor of Pennsylvania, Nov. 20, for the charter of an intended corporation to be called the B. S. Hammill Coal Co., the character and object of which is the purchasing, leasing, holding, selling and developing of lands containing coal, mining, preparing for market and selling coal, manufacturing coke and such other materials as may be incidentally developed and their products.

Sullivan, Ind.—The Utilities Coal Co., of Sullivan, Ind., has been incorporated with a capital stock of $100,000. The directors are: William H. Hays, Alonzo C. Owens and E. A. Jewell. The purposes of this corporation are to conduct operations and transactions of any and all kinds relating to the mining and sale of coal. It now owns and has under lease a considerable body of fine coal land which will be shortly developed.

Industrial News

Chicago, Ill.—The Illinois Central will soon place an order for 6000 coal cars besides large orders for refrigerator cars and locomotives.

Chicago, Ill.—It is rumored that the next annual report of the U. S. Steel Corporation will show the acquisition of about 70,000 acres of coal land in the Illinois field.

Jackson, Mich.—It is expected that the state of Michigan will soon begin the mining of coal on a large scale in and about the city of Jackson. Convict labor will be used in the operation.

Charleston, W. Va.—Another good oil well came in Oct. 18, on the Goshorn tract and is estimated to be good for at least 100 bbl. a day. The well was drilled by the W. S. Edwards Oil Co.

Connellsville, Penn.—The Wheeling Center Coal Co. has sold 1000 acres of coal in Union district to the Wheeling Steel & Iron Co., adjacent to the latter's mines and workings. The price paid was not stated.

Connellsville, Penn.—It is reported that the H. C. Frick Coke Co. will build coke ovens and develop its large coal tract, four miles south of Monessen. The coal is part of that purchased recently from the Pittsburgh Coal Co.

Montgomery, Ala.—W. J. Gilmore has announced that he has contracted with the barge line to furnish 1500 tons of coal per day and will be ready to supply same as soon as the barge line is in operation. The barges to be used are 230 ft. long by 32 ft. wide.

Galena, Ill.—The exodus of Greeks and other foreigners who are returning to their native country to fight against the Turks has resulted in the closing up of twelve lead and zinc mines in this district. Other mines will probably have to close soon. Over 500 men have left within the past few weeks.

Pittsburgh, Penn.—Coal interests for a long time located near the Monongahela River front, have closed leases for nearly the entire twenty-second floor of the First National Bank Building, in this city. These companies are among the oldest in Pittsburgh to leave their offices on the river front. Only recently the United Coal Co. closed a lease for the entire seventeenth floor of this building.

Connellsville, Penn.—A simple and efficient watering device has been invented and put into successful use by D. C. Staust, operating manager of the Taylor Coke Co.'s plant. The device is automatic, requiring only to be inserted and removed from the oven when the watering-out process is complete. It has been in successful use on a royalty basis for several years. One man can water ovens for one mechanical drawing outfit.

Patton, Penn.—After a week's idleness, due to repairs, mine No. 28 of the Pennsylvania Coal & Coke Corporation, resumed operations Oct. 30. For a whole week men have been working night and day on improvements about the workings. The tipple has been raised 6 ft. to permit cars to be run under it, and concrete piers have been put in. The tracks to the dump have been raised 6 ft. in some places so that the cars now run to the dump by gravity. Rope haulage is being replaced by electricity. Three hundred men employed at No. 28 were put to work on night shifts at other mines so that they were not idle.

Pittsburgh, Penn.—The Pittsburgh Crucible Steel Co. is arranging to operate its new coking coal mine in Greene County, which will supply coking coal for the ovens of that company located near the Midland plant. An interesting feature of this operation is that while the coal is being mined exclusively for coking purposes, there will be no ovens near the mine, and all the coal will be loaded into especially built steel flats and brought down the Monongahela and Ohio Rivers and placed at the coke plants of the company near the mills. This is the only operation of this kind in Greene County.

Phillipsburg, Penn.—The Hillside mine, owned and operated by Chas. H. Rowland, has recently undergone many improvements. Electricity has been installed throughout the mine, heavier rails have been laid, and grades lessened. A new blacksmith shop and motor generator have been put in operation at the mouth of the drift, and the track and trestles of the dump have been remodeled.

Over 60 men are employed at present and from 150 to 175 tons are being hauled out daily. When the mine is complete, it is expected that employment will be furnished to several hundred men and the output will be increased to 500 tons per day.

Denver, Colo.—The last $5000 necessary for the full operation of the state coal mine has now been secured and a meeting of the Board of Directors was held in Denver recently, for the purpose of arranging plans for the opening of the main shaft in the near future, and the operation of the mine on a large scale. Orders for a number of carloads of coal for shipment are waiting to be filled.

A siding may be built near the old section house and negotiations in this direction are underway. If this is obtained, it will make it possible for the teams to make about two extra trips per day and about 30 tons more of coal can be hauled from the mine daily.

Bethlehem, Penn.—The Lehigh Coke Co., located at Bibier, is operating a first-rate byproduct coke plant in Easton, Penn. This plant will utilize 5000 tons of coal per day, and the gas from the coal will pass to a 1,000,000-cu.ft. capacity collecting tank, and thence to openhearth furnaces and steel-heating pits of the Bethlehem works. This will be a great saving in fuel costs.

The 300 coke ovens will be operated by mechanical devices, 125 men handling all the work.

The gas plant consists of six units, each capable of producing 4,000,000 cu.ft. of gas every 24 hr. The Bethlehem Steel Co. has the contract for the entire output of gas, of which it needs 4,000,000 cu.ft. per day. The remainder it has sold to the East Penn Gas Co., at 16c. per thousand cubic feet. It has a 20-year contract. With this gas, the East Penn Co. will supply some 20 neighboring towns and villages for heating and lighting purposes.

Lehigh, Okla.—One million dollars is involved in the railway field, which marks the first entrance of the Santa Fé system into the Oklahoma coal field at Lehigh. This entrance will be effected by means of the Oklahoma Central Ry., built and developed by Dorset Carter, which runs from Chickasha to Lehigh, a distance of 131 miles. The deal embraces the properties of the Western Coal & Mining Co., formerly owned by the Gould system, and properties of the Folsom-Morris Coal Mining Co. The combined holdings embrace over 10,000 acres of coal land.

It is the intention of the company to spend large sums of money in the improvement of these properties. The railway will immediately extend its line to Midway, a distance of five miles, and is already making extensive improvements in order to handle the tonnage which will be produced by this company. It is expected that within 90 days this amount will reach 2000 tons daily.

Coal Trade Reviews

Current Prices of Coal and Coke and Market Conditions in the Important Centers

General Review

Hindrances and delays in both production and transportation are now the rule and there appears little probability of the hard coalers overcoming the shortage. Originating companies are withdrawing their Eastern fleets because of the dearth of domestic grades for shipment. Stocks at all the centers are appreciably less than at any time during the last five years or more, and requisitions are filled only in event of the most urgent requests; duplication of orders has doubtless created an artificial demand, but the trade is nevertheless facing a strenuous situation.

The declaration of a number of car embargoes is the most important feature developed in the Eastern bituminous trade during the week. The market would be surfeited with coal were it not for the transportation troubles, but as it is there is a pronounced scarcity and little or no new business is being undertaken. Long detention is still the rule in the coastwise trade.

The car shortage in the Pittsburgh district has attained the most serious proportions of the year. As a result, the curtailment during the recent holidays was hardly felt. Contracting is mostly for the year, though occasionally for six months; contract prices are at the full season's circular or higher. The high price level and lack of equipment for loading are the predominating features in the Ohio trade. Some of the roads have commenced confiscating fuel, and there are indications of famine conditions.

The September dumping at the Hampton Roads piers was quite disappointing, due to the lack of adequate transportation facilities. In the Southern markets the consumers are buying extensively for storage, and because of the lack of cars, all kinds of equipment is being used.

As a result of the rumors of a shortage in the Middle West, stocks in the hands of the dealers are being rapidly depleted, and are probably smaller than ever before at this period.

Boston, Mass.

The car embargoes were the main feature in bituminous news this week. Spot coal at tidewater remains practically unchanged from a week ago. There seems to be a lull in the market but this can hardly be more than temporary. The continued mild weather has certainly helped out the coal trade.

Georges Creek output is reported to be quite small for the present and that increases the demand for the better grades from Pennsylvania. Prices can hardly be said to have advanced during the week, but there is a notable decrease in the amount of spot coal available in all grades. Long detention is still the rule at Baltimore and at Hampton Roads.

In anthracite one more of the originating companies has withdrawn its Eastern barge fleet, because of the shortage in domestic sizes, and this reduces the available sources of supply for New England still more. Coming at a time when there were hopes for more, rather than fewer shipments, the news is depressing. A sharp turn in the weather will reveal a rather startling situation in all the larger centers, so close are dealers generally to the end of their supplies. This is the time of the year when delays and hindrances multiply and it is apparently hopeless now to think of catching up on anthracite for this market.

Current quotations are about as follows:

Clearfields, f.o.b. mine	$1.35@1.75
Clearfields, f.o.b. Philadelphia	2.60@3.00
Somersets, f.o.b. mine	1.55@1.85
Somersets, f.o.b. Philadelphia	2.80@3.10
Pocahontas, New River f.o.b. Hampton Roads	3.25@3.50
Pocahontas, New River on cars Providence	4.25@4.35
Pocahontas, New River on cars Boston	4.40@4.60

New York

Bituminous—The numerous holidays during the current week and last week appreciably limited the production at the soft-coal mines. The car and labor shortage are also factors in the situation and are tending to tighten the market still further.

The trade in general is quite spotty. Prices show indications of becoming softer occasionally, but it depends almost entirely upon whom the matter is being discussed with. Supplies are quite short, and all the arrivals are going into immediate consumption. Should there be any severe weather which would interfere with shipments and create an active domestic demand, it would precipitate an acute situation in this market.

We continue previous week's quotations as follows:

West Virginia, steam	$2.95@3.05
Ordinary grades, Pennsylvania	2.95@3.05
Fair grades, Pennsylvania	2.95@3.05
Good grades, Pennsylvania	3.10@3.15
Best Miller, Pennsylvania	3.15@3.25
Georges Creek	3.50

Anthracite—The hard coalers appear to have come through the recent holidays with a much better production than the bituminous operators. Thus, for instance, one of the large anthracite companies reports between 60 and 70 per cent. normal production on election day. That producers are straining every nerve to obtain the utmost possible tonnage from their mines, is evidenced by the numerous reports of new high records established.

There is a noticeable shortness of labor at the mines, but the scarcity of cars seems to be the limiting factor in the situation. This has been in evidence in bituminous for some time, and has only attained serious proportions with the anthracite companies within the last few weeks.

There has been no appreciable change in prices and we continue last week's quotations as follows:

	Upper Ports	Lower Ports
Broken	$5.00	$4.95 @ 5.75
Egg	5.25	5.20 @ 6.85
Stove	5.25	5.20 @ 6.85
Nut	5.50	5.45 @ 6.85
Pea	3.50	3.35 @ 3.75
Buckwheat	2.75	2.25 @ 2.45
Rice	2.25	1.85
Barley	1.75	1.95

Pittsburgh, Penn.

Bituminous—The supply of cars has grown still less and the situation is now the worst of this year. Last week's loading was materially less than the week before, and the present one has opened up worse than last week. Shipments are now somewhat below 50 per cent. of capacity. The shortage of labor has been more noticeable the past few days, but with the car supply decreased, the loss is not felt so keenly. Thursday and Friday of last week were religious holidays, while this week the election has interfered.

There is practically no coal being sold for prompt shipment, as nearly all operators are behind, particularly in the Lake trade, and a very few cars purchased would clean up the supply each day, irrespective of price. No close quotations are available, but the market is probably

$1.50 to $1.75 for mine-run and about $1.25 for slack. Of course, were any considerable tonnage available, it could not be sold at such prices. There is a little contracting for the year, beginning Dec. 1 or Jan. 1, and in exceptional cases for shorter periods, but as a rule contracts run to Apr. 1, so that there is not much of this business. The circular prices of the year are being quoted on contracts, with one or two producers slightly higher, but probably not closing any business at such figures, and we quote the regular prices as representing the contract market: Mine-run and nut, $1.22½; ¾-in., $1.32½; 1¼-in., $1.47½; slack, 82½c. per ton at mine, Pittsburgh district.

Connellsville Coke—The prompt-coke market has stiffened further. At the beginning of last week it was possible sometimes to do $3.75 on prompt furnace, and $3.85 was regarded as fairly high, but late in the week $3.85 became a bargain price, and on Saturday sales were made at $4.10, $4 being regarded as the absolute minimum. This week there is little to offer, but inquiry is also light, as those who expected to need coke this week took action last week. Production was decreased materially last week by the holidays, and this week by the election. There is little coke offered on contract for next year, operators preferring to hold off, but $3 for the first half and $2.75 for the whole year seem to represent minimum prices which might be done by a good buyer. Foundry coke is equally scarce with furnace. We quote: Prompt furnace, $4@4.25; contract furnace, $2.75@3; prompt foundry, $4.25@4.50; contract foundry, $3@3.25 per ton at ovens.

The *Courier* reports production in the Connellsville and lower Connellsville region in the week ending Nov. 2 at 397,253 tons, a decrease of 2552 tons, and shipments at 4322 cars to Pittsburgh, 6572 cars to points west and 729 cars to points east, a total of 11,623 cars, a decrease of 131 cars.

Philadelphia, Penn.

With the near approach of cool weather, the dealers are becoming more and more insistent, and the wholesalers are at their wits end, trying to keep them quiet. Stove is in most demand, with egg and chestnut a close second; in fact, all sizes of the domestic variety are scarce, and more talk of premiums is heard on the street than ever before. The price of $5 to $5.50 at the mines seem to be the standard quotation for both egg and stove, from speculative operators.

The sales agents of the large companies are finding it difficult to preserve their reputations for truthfulness, although many of them are rather vague in their promises, and it takes a needy case to bring out a definite shipment. But taking it all in all, it is doubtful if any one is actually suffering from lack of fuel at present. Householders want prompt shipments, and if they cannot secure them from one dealer they go to another, which results in an artificial demand. The stocks at all yards are far less than at any corresponding period during the last five years, and while unfortunate at this time, it is a favorable index of business conditions. It is the general feeling, however, that the anthracite industry will be up against a very strenuous campaign the coming winter.

Bituminous trade is following in the steps of anthracite. It is understood that, in some instances, contracts are not being kept up to requirements, and the explanation is made that this is occasioned by the car shortage. There may also be another reason, such as attractive prices in other directions, but this is only problematical. It is a fact that there is a serious shortage of cars, and the situation is not likely to improve.

Baltimore, Md.

There is a pronounced scarcity of coal in the Baltimore market at this time, owing to the lack of sufficient cars to handle the business. So great is the demand for equipment on the B. & O. that an embargo was placed on all coal cars. Whether this will relieve the situation sufficiently to enable the operators to properly care for their contract business remains to be seen. The local trade is still running away from new business, as they cannot begin to furnish old consumers with the fuel they are demanding.

With the product scarce, prices are naturally firm. There has been no change in quotations from the week previous and it is expected that the prevailing prices will continue until there is some relief in the car situation. Operators realize that all grades of fuel are abnormally high, and that when more equipment becomes available quotations are bound to drop. Producers as a whole would rather see a reduction in prices, provided they can get the necessary equipment. Business during the past month has not been so profitable to the trade as a whole, as appears on the surface.

The anthracite market continues active with consumers buying freely at the advanced prices. The higher quotations have been accepted as a matter of course, and there has been none of the usual complaint heard in other cities.

Buffalo, N. Y.

There is a slacking off in the demand for anthracite, on account of the heavy mining and the mild weather, but this will not last when the weather turns cold. Coke is so far oversold that the ovens are quoting prices so high that they are prohibitory.

A Buffalo jobber and mine representative, estimates that the summer prices for bituminous were about $1.05 to $1.10 at the mines for Pittsburgh mine run and are now about $1.40 to $1.50. This is a very good market, even to those operators who have a large amout of cheap contracts to fill, while it is a fortune to such as were idle till the stir set in and now have their entire output available.

There would likely be too much bituminous mined were it not for the car shortage. It is estimated that not much more than half the necessary equipment is provided in the Allegheny Valley. Quotations are $3.15 for Pittsburg lump, $3 for three-quarter, $2.85 for mine-run and $2.45 for slack. Coke is $6.25 for best Connellsville foundry, with plenty of quotations at $4.50 at the ovens, to which must be added $1.85 for freight to this market.

While there is no indication that the leading anthracite companies are preparing to ask an advance this fall, the independents are easily obtaining $6 at the mines for stove and chestnut, with an added $2 freight to Buffalo.

Anthracite shipments by Lake for October were 759,300 tons, a new record. For the season to November the amount is 3,223,654 tons, as against 3,380,329 tons to the same date last season. The small lead of last season is not likely to last long at present rate of shipment.

Columbus, Ohio

High prices and the car shortage are the two features of the coal trade here. The car shortage has reached such a point that most of the Ohio mines are working at about 25 to 35 per cent. of capacity. As a result there is a further advance in prices on spot coal and it is difficult to get a line on quotations. A shipper or operator who has any free coal can get almost any price within reason.

The sudden cold snap caused quite a rush of orders for the domestic grades; shippers are simply overwhelmed. A fuel famine is threatened in every section and dealers in central and northern Ohio and parts of Indiana and Michigan are clamoring for coal. Every market is tied up and there is no relief in sight.

Railroads are now confiscating coal to keep their trains moving. Manufacturers and large users of steam grades have been attempting to stock up but the condition of the car supply is such that this is out of the question, and not a great deal of tonnage is moving to the Northwest via the Lakes. But the time is approaching for the close of navigation and as a result not much more could be shipped. There is every indication of a fuel famine in the Northwest, especially should there be a severe winter.

Dealers are overwhelmed with orders and are often unable to make deliveries. Their stocks are light as railroads have been slow in making shipments. As a result small orders are the rule and the consumer has to be content with a part load.

Quotations in Ohio fields are:

	Hocking	Pittsburgh	Pomeroy	Kanawha
Domestic lump	$2.25		$2.50	$2.25
2-in.	2.00	$1.60	2.00	2.00
Nut	1.70		2.00	
Mine-run	1.75	1.50	1.75	1.75
Nut, pea and slack	1.15		1.25	1.00
Coarse slack	1.05	1.25	1.25	0.90

Hampton Roads, Va.

The car shortage at the mines is giving Hampton Roads shippers more concern right now than anything else. Charter lists for coal are heavy, having diminished none during the past week. There are still good sized fleets of vessels waiting for coal and berths at two of the local piers. The Virginian Railway piers, at Sewalls Point, are probably making the best showing during this strenuous period. As this line has no Western outlet, they are better able to keep cars than the other two roads.

Dumping figures for October are disappointing; while there is a heavy demand and large charter lists the coal is not being moved on account of the inadequate car supply. The Norfolk & Western Ry. handled 406,606 tons over their Lamberts Point piers in October; the Chesapeake & Ohio Ry., at Newport News, 275,319, and the Virginian Ry., at Sewalls Point, 239,561, or a total of 921,486, which is less than the month of September.

Birmingham, Ala.

Buying coal for stocking purposes, regardless of contracts, seems to be the slogan of steam consumers at this time. The car situation is not improved and one of the largest railroads in the district has turned practically all of its gondola equipment into the coal trade, having issued instructions that this class of equipment cannot be used for shipment of pipe if destined to points off the system.

Construction work in general is being retarded in this section on account of the serious car shortage, and it is doubtful if any more pig iron furnaces can be put in blast until relief in this line is furnished.

Louisville, Ky.

The car shortage in the Tennessee and Kentucky fields has become more pronounced than at any time in the past seven or eight years. The situation is at its worst in the western Kentucky fields, where the car supply appears to be decreasing directly as the demand increases.

Nearly all the companies are seriously behind on their contracts, and with no free coal in the market it is difficult to quote any prevailing prices. For what small quantities are available, the market is probably about as follows: Eastern Kentucky and Tennessee lump, $2.50; West Virginia smokeless lump, $2.75 @ 1.75; Pittsburgh lump, $2.30 in barge lots; Jellico and Straight Creek round, $1.75; nut, $1; nut and slack, 60@80c., with second grades somewhat lower. Western Kentucky is practically out of the market, but we quote: Best lump, $1.50; No. 2 lump, $1.15; round, 90c., with nut and slack, 60@65 cents.

Indianapolis, Ind.

There was no advance in coal prices here the first of the month and dealers are of the opinion that there will be none. While the weather until the last day or two has been such as not to require continuous house fires, dealers, stocks were depleted because of the demand caused by the reports of the coal shortage. They have not been able to fill all orders for anthracite and stocks of bituminous are probably smaller than ever before at this early period of the winter season. Prices are also higher than ever before at this date. Prices are uniform in this market, there being no cut-throat competition. The bituminous trade feels the shortage of cars and there is little hope for improvement this month. On the leading coal roads in the state, mines are operated less than half-time.

Detroit, Mich.

Bituminous—With all the railroads in the city embargoed and the C. & O. refusing to allow their cars to come North, Detroit is facing a serious situation. There seems to be plenty of track coal but none of it can be moved. Large consumers of soft coals have a considerable stock on hand, but not more than a 30-days' supply, and unless the embargoes are lifted the situation will be very acute. The weather has been very mild for sometime, and it is hoped by all large consumers that it will continue so indefinitely, so the operators will have an opportunity to catch up on orders.

Prices prevailing at present are as follows:

	W.Va. Splint	Gas	Pocahontas	Hocking	Jackson Hill
Lump and egg			3.00	2.25	2.75
Domestic lump	1.85				
2 lump	1.70	1.70		1.75	
Mine-run	1.50	1.50	1.75	1.50	
Slack	1.00	1.00	1.50	1.20	

Coke—Coke now is in greater demand than it ever has been in this city, and the manufacturers are taxed to their utmost to meet the demand. The prices are firm, and seem to remain stationary.

Chicago

Chicago coal dealers believe there will be a very strong market during the next three months. As a result of the shortage of anthracite there has been a large amount of speculative selling in coke. Most of the ovens have accepted orders that will tie them up for at least two months and some of which they probably will not be able to fill within the next five months.

Should the smokeless producers apply their total output to making up the present shortage in anthracite, the deficiency would not be covered, and at the present time they have their hands full in attending to their own trade.

The price on smokeless mine-run ranges from $1.40 to $1.50. Indiana coal operators have caught up on spot sales made for October delivery and are now offering a little free coal for the market. Prices are strong on Carterville and Harrisburg coals.

Prevailing prices at Chicago are:

	Sullivan Co.	Springfield	Clinton	W. Va.
4-in. lump	$2.87			
Domestic lump		$2.82	$2.77	
Egg	2.87			$4.55
Steam lump		2.12	2.27	
Mine-run	2.32@2.42	1.97	2.17	3.65
Screenings	1.52@1.57	1.42	1.52	

Coke—Prices asked for coke are: Connellsville, $6.25@6:50; Wise County, $6.25@6.50; byproduct, egg and stove, $5.50; byproduct, nut, $5.50; gas house, $5.50.

Minneapolis—St. Paul

Receipts of bituminous at the head of the Lakes during the past month have only been fair, while outgoing shipments are about as heavy as normal at this time of the year. Up to the present there has been only an occasional day when the car supply has been short at the docks. Hocking on the docks is said to be quite short; shipments passing through the Soo Canal during September this year were but 30,000 tons as compared with 130,000 for the same month last year. The October receipts at the head of the Lakes was expected to be rather large, but the fact is they were disappointingly small.

Anthracite has been coming to the head of the Lakes at the rate of about a cargo per day, or an average of about 5000 tons daily, but there has been no accumulation to speak of. What hard coal was received has been doled out sparingly in filling orders on the books. It is estimated that up to Nov. 1 there was not 175,000 tons of hard coal on all the docks, which is a meager supply to go into the winter with.

St. Louis, Mo.

The condition of the St. Louis coal market is somewhat quieter than it has been for the past month. There has been a gradual drop in the price of Standard coals, and in fact, in all of the Inner Belt fuels, while Carterville has been holding its own.

The domestic demand, which eased of

rather suddenly, has picked up some in the past week, but the first rush of domestic orders is over and from this time on it will be a steady call.

The demand for anthracite is remarkable, and premiums of $1 per ton are offered. The same thing applies to coke, and smokeless coal is firm now at about $5.50, St. Louis, and somewhat hard to get for lump and egg.

The prevailing prices are:

Carterville	
6-in. lump	$2.00@2.15
3x6 egg	1.85@2.00
No. 1 nut	1.65@1.75
Screenings	0.75@0.85
Mine-run	1.20@1.30
No. 1 washed	2.10@2.25
No. 2 washed	1.60@1.75
No. 3 washed	1.35@1.40
No. 4 washed	1.05@1.15
No. 5 washed	0.90@1.00
Murphysboro Big Muddy	
Lump and egg	$2.25
Trenton Sootless	
Lump and egg	$2.40
Mount Olive	
6-in. lump	$1.65
3-in. lump	1.50
2-in. lump	1.40
Screenings	0.50
Standard	
6-in. lump	$1.30@1.40
2-in. lump	1.10@1.20
Screenings	0.40@0.45

Odgen, Utah

According to local dealers, Utah is threatened this winter with one of the most serious coal famines in its history, due, they claim, to the shortage of cars. It is said that the Eastern railroads have called in all cars and that Western roads are dependent on their own equipment to handle the business, which is exceptionally heavy at this time. So far, however, prices have not been affected as a result of the situation.

The dealers have already been obliged to draw on the piles in their yards; ordinarily they are not compelled to resort to these until after Dec. 1. The only thing that has relieved the situation so far is the unusually warm weather for this time of the year.

Quotations are about as follows, f.o.b. mines:

	Rock Springs	Utah
Lump	$2.75	$2.75
Nut	2.00	2.25
Mine-run	1.85	
Slack	1.00	1.25
5-in. lump		2.50

San Francisco, Calif.

Imports of foreign coal for month of September totaled 34,912 tons, of which 16,073 came from British Columbia, 17,789 from Australia, and 1050 from China, the latter shipment consisting of 1000 tons of anthracite and 50 tons of blacksmith coal.

Prices to the trade are as follows per short ton:

Wellington (British Columbia)	8.00
Pelan Main (Australia)	8.00
Rocky Mountain	8.00
Cumberland (Wyoming)	12.50

No improvement is shown in the movement of coal; weather conditions have been abnormally good for this time of the year, and for other than strictly domestic use there has been no demand.

Production and Transportation Statistics

Imports and Exports

The following is a comparative statement of imports and exports in the United States for the first 8 months of 1911-12, and for August of the current year, in long tons:

	8 months		
Imports	1911	1912	August
Anthracite	844,959	1,025,388	155,985
Bituminous	51,225	61,156	13,366
Exports			
Anthracite	2,294,005	2,186,330	540,438
Bituminous			
Canada	6,428,135	6,696,010	1,328,189
Panama	344,912	312,227	22,402
Mexico	378,740	224,561	13,775
Cuba	671,219	757,635	111,173
West Indies	364,704	480,410	32,641
Other countries	455,149	1,197,509	82,995
Total	8,642,859	9,668,352	1,591,175
Bunker Coal	4,406,351	4,943,257	623,743

Various Railroads

The following is a comparative statement of the fuel movement over various railroads, for the eight months ending August, 1911-12[1]:

Railroads	1911	1912
Baltimore & Ohio[2]	22,190,507	26,528,514
Buffalo, Rochester & Pittsb.[3]	5,279,676	5,661,217
Buffalo & Susquehanna[3]	1,274,358	1,129,848
Chesapeake & Ohio[2 4]	8,841,927	10,480,973
Erie[4]	4,652,237	4,185,227
Hunt'g. & Broad Top Mt.[2 3]	704,585	759,244
N. Y. Central & Hudson River[3]	5,268,508	5,138,143
Norfolk & Western[3 5]	13,180,827	16,134,456
Penn. (East of Pittsb. & Erie)[3 5]	41,487,310	45,257,912
Pittsburgh & Lake Erie[2 5]	10,336,204	11,394,445
Pittsb., Shawmut & Northern[3]	931,326	1,235,357
Southern[4]	2,123,200	2,419,835
Virginian[2 3]	1,703,903	2,334,751
Western Maryland	1,740,718	1,928,205

[1]Figures throughout this table have been reduced to a uniform basis of short tons.
[2]Includes coal received from connecting lines.
[3]Includes company's coal.
[4]July and seven months' figures.
[5]Does not include company's coal hauled free.

Baltimore & Ohio R.R.

The following is a comparative statement of fuel movement over the B. & O. R.R. and affiliated lines for August and September, 1911-12, in short tons:

	August		September	
	1911	1912	1911	1912
Coal	2,651,848	2,919,911	2,614,201	2,784,230
Coke	347,457	409,627	341,350	386,335
Total	2,999,305	3,329,538	2,955,551	3,170,565

Colorado Fuel & Iron Co.

The following is a comparative statement of this company's coal production during the past three fiscal years ended June 30:

	Coal	Coke
1907-08	4,276,095	789,989
1908-09	4,094,352	645,545
1909-10	4,722,832	905,599

Norfolk & Western Ry.

The following is a comparative statement of the coal and coke shipments over the lines of the N. & W. Ry. for the month of September of the current year, and the first nine months of the years 1911-12, in short tons:

		Nine Months	
Destination	September	1911	1912
Coal			
Tidewater, foreign	68,672	738,871	1,094,529
Tidewater, coastwise	331,489	2,187,325	2,798,700
Domestic	1,528,376	11,043,529	13,245,865
Coke			
Tidewater, foreign		61,665	52,762
Domestic	113,035	1,082,569	1,014,174
Total	2,041,572	15,131,959	18,176,028

The Car Situation

The following table shows the surplus and shortages of cars on 179 roads on Oct. 24:

	Surplus	Short	Net Surplus
Box	2,179	40,356	*38,177
Flat	1,197	5,034	*3,837
Coal, gond. and hopper	5,123	18,376	*13,253
Other kinds	8,790	3,504	5,386
Total	17,289	67,270	*49,981

*Shortage.

Pennsylvania Railroad

Statement of coal and coke carried on the P. R.R. Co's. lines east of Pittsburgh and Erie during September and the first 9 months with the increase or decrease over the same period last year, in short tons:

	Sep ember	9 Months	Difference
Anthracite	935,550	7,387,837	—1,101,613
Bituminous	3,906,164	34,114,059	+3,609,716
Coke	1,073,613	9,671,343	+1,790,736
Total	5,915,327	51,173,239	+4,298,839

Foreign Markets

Great Britain

Oct. 25—Owing to inadequate tonnage supplies, sellers of large coal are finding it necessary to take easy figures for spot loading, but are not disposed to deal forward except at higher values. Smalls are a firm market, supplies being scanty as the result of stoppages at the mines.

Prices are as follows:

Best Welsh Steams	$4.02 @ 4.08
Best Seconds	3.96
Seconds	3.78
Best Dry Coals	4.08
Best Monmouthshire	3.66
Seconds	3.48
Best Cardiff Smalls	2.58 @ 2.64
Seconds	2.46 @ 2.52

The prices for Cardiff coals are f.o.b. Cardiff, Penarth, or Barry, while those for Monmouthshire descriptions are f.o.b. Newport, both exclusive of wharfage, and for cash in 30 days—less 2½%.

France

The following is a comparative statement of French imports and exports for the first six months of the current year and the last year:

	Imports.		Exports.	
	1911	1912	1911	1912
Coal	8,213,100	7,217,100	638,065	1,068,779
Coke	1,213,500	1,314,100	73,651	83,592
Briquettes	580,700	528,100	60,795	98,668

Production of the Loire department for the year 1911 is reported at 3,692,321 tons, as compared with 3,691,879 tons for the year previous.

Financial Department

Annual Reports, Notes and Comments on the Various Coal Securities

Lehigh & Wilkes-Barre Coal Co.

The outstanding capital stock of this company amounts to $9,212,500, of which the Central R.R. of New Jersey owns $8,491,150. The following is President Baer's annual report for the fiscal year ended June 30, 1912, as compared with the year previous:

TONNAGE, EARNINGS AND EXPENSES

Tonnage shipped	1911-12	1910-11
From co.'s fee lands, by company	2,836,117	3,042,486
From co.'s fee lands, by tenants	844,888	967,933
From leased lands, by company	1,087,109	1,104,545
From leased lands, by tenants	161,001	115,024
From washeries, by company	62,198	137,411
From washeries, by tenants	107,237	171,943
Total	5,098,552	5,539,345
Earnings		
Coal sales	$18,271,001	$16,390,244
Coal mined by tenants	306,928	350,032
Miscellaneous	164,695	139,299
Total	18,742,624	16,879,575
Expenses		
Mining coal and repairs	6,450,714	6,297,131
Colliery improvements	261,181	209,743
Royalty leased properties	341,089	341,156
Coal purchased	1,691,392	1,756,014
Transportation, yard and agency exp	3,885,289	3,876,863
General expenses	119,219	124,562
Taxes, state and local	689,535	631,887
Taxes, Federal	29,934	17,193
Insurance	16,386	16,180
Maintenance of property	28,058	.....
Value of coal sold from stock	1,469,465	152,657
Total	14,982,263	13,423,386
Net earnings	3,760,361	3,456,189
Deduct		
Fixed interest on bonds	814,390	814,390
Sinking funds	460,000	460,000
Dividends (13%)	1,197,625	1,197,625
Total deductions	2,472,015	2,472,015
Surplus	1,288,346	984,174

CONDENSED BALANCE SHEET

Assets	1912	1911
Property and equipment	$28,136,335	$28,125,885
Advanced royalties for coal	1	1
Cash	2,701,607	1,224,083
Cash for coup., etc	11,806	20,123
Bills and accounts rec	3,454,857	2,174,664
Coal on hand	110,028	1,579,493
Land contracts not due	12,025	14,770
Insurance, adv. payments	14,283	31,991
Material and supplies	347,397	318,200
Securs. of cos. owned	281,001	281,001
Marketable securities	732,596	732,596
Sinking fund	932,743	460,000
Suspense accounts	123,911	285,667
Total	36,858,590	35,248,475
Liabilities	**1912**	**1911**
Capital stock	9,212,500	9,212,500
Funded debt	19,687,000	19,687,000
Consols due June '10	.....	1,000
Sk. fd. 4% consol. gold loan	971,076	498,333
Vouchers and pay-rolls	1,014,676	921,204
Coup., etc. unpaid	11,806	20,123
Int., mine rents, etc., not due	634,846	590,000
Reserve for new collieries, etc	1,694,090	1,729,905
Land suspense account	17,650	21,398
Suspense accounts	45,345	285,667
Profit and loss	3,569,691	2,281,345
Total	**36,858,590**	**35,248,475**

Virginia Iron, Coal & Coke Co.

President John B. Newton, of the Virginia Iron, Coal & Coke Co., in his recent annual report to the stockholders says:

The past year has not been unlike the two preceding years in the iron industry. The problem before your management has been to operate on the most economical basis possible, and, at the same time, keep up the efficiency of your plants in order to be prepared to reap the benefits of improved conditions in the iron marketwhen they come. The efficiency of your plants has certainly been maintained, and examination of the statements included in this report will show that liberal charges have been made against depreciation of plant and equipment and against depreciation of iron ore lands and coal lands, amounting in the aggregate to $320,808, and that $149,696 has been expended in improvements.

During the past year we have operated only one furnace constantly and one furnace for five months of the year, out of nine hot blast furnaces, and only one of our two cold blast charcoal furnaces for eight months of the year. We produced only 77,200 tons of standard foundry iron and 2231 tons of cold blast charcoal iron, and shipped 100,820 tons of standard foundry iron and 2396 tons of cold blast charcoal iron.

Within the past sixty days the iron market has shown marked improvement, and, at the present time, there is a strong demand for iron at fairly remunerative prices. We now have orders on our books amounting to 62,000 tons of iron, the most of which is for delivery between now and January first, and are booking a fair tonnage daily for delivery during the first three months of 1913. We are, on this date, operating one charcoal and two coke furnaces; will blow in Radford furnace within next ten days, and our Pulaski furnace as soon as practicable. We have large stocks of ore on hand at our different furnaces and are well prepared to meet the increase in demand for iron which is steadily increasing.

Your coal business has shown splendid improvement during the year, and I am sure will continue to improve year by year. Your mines produced, during the year, 1,563,284 tons of coal at a profit of $308,419 as against a production the preceding year of 1,404,638 tons at a profit of $226,698, which was the best year in the coal business your company had had up to that time.

Although we charged, during last year, against the cost of mining your coal $83,778 for depreciation of coal lands and $45,696 for depreciation of improvements at your coal plants, I feel justified in stating to you that the value of your coal lands has increased several times that amount, and that your coal plants and equipment were well maintained and are certainly in as good condition today as they were a year ago.

Financial Notes

The following table gives the range of various active coal securities and dividends paid during the week ending Nov. 2:

Stocks

Company	High	Low	Last
American Coal Products	95	95	95
American Coal Prod. Pref.	111	111	111
Col. Fuel & Iron	37	34½	36¼
Consolidation Coal of Md.	103⅜	103⅛	102⅝
Island Creek Coal	86½	86½	86½
Lehigh Valley Coal Sales	260	250	
Pittsburg Coal	24½	23¾	23¾
Pittsburg Coal Pref.	94	91½	93
Pond Creek	24¾	2[illegible]	24⅜
Reading	174¼	168¼	170½
Reading 1st. Pref	88	88	88
Reading 2nd. Pref	97½	96	96
Virginia Iron C. & C	64½	63	64½
Westmoreland Coal	81	81	

Bonds Company	Closing Bid	Asked	Weeks Range or Last Sale	
Colo. F. & I. gen. s f g 5s	98¾	100	98¼	Sept. '12
Colo. F. & I. gen. 6s	108	108½	107½	June '12
Col. Ind. 1st & coll. 5s. gu.	84¾	Sale	83½	84½
Cons. Ind. Coal Me. 1st 5s.	....	84¼	85	June '11
Cons. Coal 1st and ref. 5s.	....	93¾	93	Oct. '12
Gr. Riv. Coal & C. 1st g 6s.	93½	96	102⅜	Apr. '06
K. & H. C. & Co. 1st s f g 5s.	98	....	98	Oct. '12
Pocah. Con. Coll. 1st. s f 5s.	85	88	87	Oct. '12
Tenn. Coal gen. 5s	101¼	101⅜	101⅜	101⅜
Birm. Div. 1st consol. 6s.	102	102¾	103¾	Sept. '12
Tenn. Div. 1st g 6s	102	102½	102¼	Oct. '12
Cah. C. M. Co. 1st g 6s.	103½	110	110	Jan. '09
Utah Fuel 1st g 5s	....	....	....	....
Victor Fuel 1st s f 5s	....	85½	85½	Oct. '12
Va. I. Coal & Coke 1st g 5s.	97	97½	97½	97½

DIVIDENDS

Lehigh Coal & Navigation Co.—Regular quarterly No. 136 of $1 payable Nov. 30 to holders of record Oct. 31.

Cape Breton Coal, Iron & Railway Co. (Ltd.)—In addition to the recent bond issue of this company there are also outstanding $921,000 of an authorized issue of $2,000,000, 5% income bonds. The total authorized capital stock of the company is $5,000,000 of which $4,000,000 has been or is agreed to be issued as fully paid.

Clinchfield Coal Corporation — This corporation, in payment of its obligations owned by the Clinchfield Syndicate, has assumed the indebtedness of the latter for money borrowed about $1,300,000 and the compensation of the Syndicate managers, about $50,000. To provide funds for these purposes and also about $1,150,000 for further developments, working capital, etc., $2,500,000 is expected to be raised by the sale of that amount of preferred stock.

Harrison-Doddridge Coal & Coke Co., Harrison County, W. Va.—This company has issued $3,000,000 bond-secured 6 per cent. coupons, three-year gold notes, dated Aug. 1, 1912, and due Aug. 1, 1915, but redeemable at the option of the company at 101 on any interest date. The issue is secured by a deposit with the Commonwealth Trust Co., of Pittsburgh, and further protected by the unconditional guarantee of principal by J. V. Thompson, who made an affidavit that he was worth in excess of $15,000,000 above all liabilities of every nature. Before notes are offered for sale there will have been deposited with the First National Bank of Pittsburgh, $540,000 to meet the interest coupons as they mature.